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FOUNDRY TRADE JOURNAL

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PRINCIPAL CONTENTS

PAGE

Exhibition Aftermath

Some comments, illustrations, and conclusions arising from the Foundry Exhibition held recently at Bingley Hall, Birmingham 3

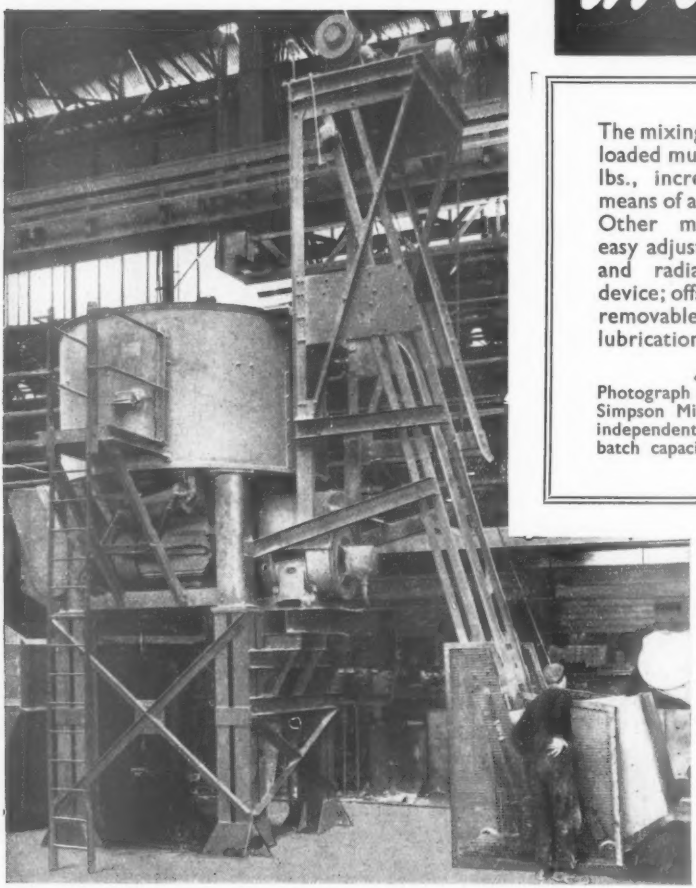
ABBF Apprentices' Competition 15

Coup d'Oeil rétrospectif à l'Exposition. Quelques commentaires soulevés par l'Exposition de la Fonderie tenue récemment à Bingley Hall, Birmingham, illustrations et conclusions. 3

Rückblick auf die Giessereiausstellung. Einige Bemerkungen, Illustrationen und Schlussfolgerungen, die sich nach der kürzlich in der Bingley Hall, Birmingham veranstalteten Giessereiausstellung ergeben. 3

Leader: The 1958 Factory Report 1
Correspondence: A Novel Presentation 2
Retirement of Mr. S. H. Russell 2
ESC's Largest Castings 10
Bridging the Gap 11
Institute of Metals Autumn Meeting 13
Dowlais Foundry Bicentenary 13
Sandwich Courses 20
Radiation Hazard Investigation 20
National Foundry College Visits 20
Bradley & Foster Golf Winners 20
W. H. Thursfield Presentation 21
Institute of Vitreous Enamellers, Silver Jubilee Conference 21
Notes from the Branches 22
Equipment and Supplies 23
American Letter 24
BCIRA "Open Day" 25
New Sales Policy 25
French Business Information 25
Raw Material Markets 29
Current Prices of Iron, Steel and Non-ferrous Metals 30
Factories Act, 1959 32
Clean Air Act Order 32
DSIR Technical Digests 32
Foundry in a Church Tower 33
Another Cast-iron Clock 33
Book Reviews and Publications Received 34

Another example of AUGUST-SIMPSON Mix-Mullers in action!



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J.J.M.

FOUNDRY
TRADE JOURNAL

Vol. 107 AUGUST 13, 1959 No. 2227

The 1958 Factory Report

A post-war—if not an all-time—record has been achieved by Mr. T. W. McCullough, H.M. Chief Inspector of Factories, in the speed of publication of his Annual Report.* Over last year there has been an improvement of at least two months, whilst compared with a few years ago, publication has been advanced by a full year. Happily, the Report announces a further—actually a four per cent.—reduction in total accidents below the 1957 figures, the figures being from 174,713 in 1957 to 167,697 in 1958. The fatal accidents, however, rose slightly in the period, from 651 to 665. The foundry accidents reported in the two years show a reduction from 8,401 to 7,820; whilst those resulting in death fell from 26 to 17. This overall reduction in foundry accidents amounts to 6·9 per cent.—or nearly double that of the country as a whole. However, there is no room for complacency, as the frequency rate in foundries, though it has declined from 2·74 to 2·66, is still second highest in the list. One foundry employing about 500 men is known where the rate is as low as 1·45!

At the Press conference when the Report was issued, Mr. McCullough attached great importance to the teaching of safety precautions to students at technical colleges, as a long-term policy. If nothing more is done than to make future executives conscious and appreciative of the importance of accident-prevention, the time devoted to the study of this subject will be well worthwhile. One other very important fact came out at this conference and that was that a statutory obligation is placed upon employees to wear the safety clothing and appliances provided either at cost or free by the employer. There is a direct relation between fire- and accident-prevention and a very important section of the Report is devoted to this subject.

From the Chief Inspector of Industrial Health, a second report (3s. 6d.) was presented. Unfortunately, it shows no reduction in the incidence of pneumoconiosis in the foundry industry as revealed by death certificates. Here the statistics are divided into iron, steel, non-ferrous and mixed foundries. Unfortunately, it is not possible to attach very great importance to the message they purport to convey—in relation to the relative risk of various jobs—as no doubt the figures relate, in each case, to the last job worked by the deceased person, whereas for proper interpretation, the whole industrial history of the man should be taken into consideration. Ex-miners, where silicosis is much more rife, sometimes finish their career in a foundry or, again, men transfer from one type of foundry to another. There were 50 cases of dermatitis voluntarily notified by the foundry industry, but here again the real position cannot be interpreted until further information is forthcoming. Where there is a risk of this disease, it is as well to employ dark-haired people, as the fair (of both sexes) seem to be much more prone!

* Annual Report of the Chief Inspector of Factories for the Year 1958, published by H. M. Stationery Office, York House, Kingsway, London, W.C.2; price 5/6 net.

This is the first normal issue of THE FOUNDRY TRADE JOURNAL since June 11 (No. 2226), publication of the intervening issues having been stopped by the prolonged dispute in the printing industry. The dispute was none of our making and we greatly regret the inconvenience caused to readers and advertisers by the break in publication.

Now that work in the printing industry has been resumed, we have endeavoured in this issue to include much of the news of recent weeks, inevitably at the expense of some of our quota of technical contents.

Correspondence

NOVEL PRESENTATION

To the Editor of FOUNDRY TRADE JOURNAL

SIR,—When you are again in full publication, could I trespass on your columns to express my appreciation of a very unique presentation made to me on my retirement (from the managing directorship) of Associated Builders Merchants, Limited.

The presentation was a beautifully bound volume (32 pages) covering some 400 signatures, from both home and overseas, of persons with whom I have had personal contact during the 30 years from the inauguration of ABM. Its compilation must have been a long and arduous task, and by reason of this is doubly appreciated.

The volume was inscribed as below, and some of the signatories have expressed a desire to see the book in its final form. Accordingly, I have arranged to return it temporarily to the ABM offices, where it is available for inspection.

If you will be good enough to publish this, it will advise all signatories of my deep appreciation

Yours, etc.

P. G. DONALD

23 The Abbey, Romsey, Hampshire.

July 17, 1959.

TO PERCY DONALD

This memento, signed as it is by so many of those who have collaborated with you in the service and development of Associated Builders Merchants, Limited, seeks to express something of the deep appreciation the signatories have felt for your outstanding ability and integrity and the breadth of your vision

We remember with pleasure the time spent in your company and the great service you have so freely rendered to industry and to your country.

May all happiness be with you in your retirement.

Export Licensing Control

The Board of Trade announce certain changes in export licensing, in force from June 29. The latest Amendment to the Export of Goods (Control) Order removes export control from copper powder. It slightly amends the liability to licensing of a few goods or re-defines them to clarify the scope of the control. The list of goods affected includes gyroscopes, control equipment, nickel, cobalt and cobalt compounds, and mechanically-propelled road vehicles. Copies of the new Order (the Export of Goods (Control) (Amendment) Order, 1959 (S.I. 1959 No: 1953) price 3d. (by post 5d.)) are available from H.M. Stationery Office, Kingsway, London, W.C.2, and branches.

The Hon. S. G. CATTO, managing director of Morgan Grenfell & Company, Limited, and Sir STANLEY HARLEY, chairman and managing director of the Coventry Gauge & Tool Company, Limited, have been appointed members of the Advisory Council of the Export Credits Guarantee Department. Sir Stanley Harley is also president of the Gauge and Tool Manufacturers' Association, and vice-president of the National Federation of Engineers' Tools Manufacturers. Other directorships held by the Hon. S. G. Catto include that of the General Electric Company, Limited, and the Mercantile Bank, Limited.

Retirement of S. H. Russell

After 57 years with the family business of S. Russell & Sons, Limited, Bath Lane, Leicester, Mr. S. H. Russell, O.B.E., has retired from the company, but his services are to be retained in a consultative capacity. To mark this event his colleagues on the board organized a complimentary dinner at the Grand Hotel, Leicester. The principal guest presided, and at the high table he was surrounded by his family, who were so numerous—18 all told—that they spread over to adjoining tables. The company mustered more than 150, the visitors coming from all parts of the country. Trade associations were represented by Sir Frederick Scopes, Mr. Noel Newman, Mr. M. J. Glenny, Mr. K. Marshall and Mr. G. Judd; research by Dr. J. G. Pearce; technology by Mr. V. C. Faulkner, Mr. J. W. Gardom and Mr. G. Lambert; customers by Mr. G. H. Grawcock and Mr. R. T. Mattinson, and suppliers by Mr. S. Perry. Mr. Bert's (S. H. Russell's) health was proposed by his brother Mr. George, who now takes over the chairmanship of the company. In his speech he reviewed the career of the principal guest, stressing the work he had done in the field of education —where for many years he was chairman of the Foundry Advisory Committee of the City and Guilds of London Institute; his leadership of the productivity team which visited the USA; his work for the Rotarians and his participation in civic matters.

Mr. S. H. Russell in reply was obviously sincere in his appreciation of the co-operation he had received not only from the members of the board but from the workpeople. Mr. P. A. Russell B.SC., proposed the guests and Sir Frederick Scopes replied. After the speeches an entertainment was provided by Mr. Peter Cavanagh.

IBF Golfing Society

This year's meeting and competitions of the IBF Golfing Society are to take place at Woodhall Spa, Lincolnshire on Saturday and Sunday, September 26 and 27 when there will be the usual party arrangements at the Golf Hotel. Full details will be published in due course, but meanwhile those intending to participate are requested to reserve the dates. New members and non-playing members and their wives are very welcome at this event, which includes social gatherings. Those interested in joining the Society should write to the secretary. Mr. J. Graham Phillips, c/o Harper Phillips & Company, Limited, Albion Foundry, Eastgate, Grimsby.

TO DEAL WITH increasing continental sales, F. Perkins, Limited, the Peterborough diesel-engine manufacturing company, is dividing Europe into two separate export zones. Manager of the west European zone, comprising Italy, France, West Germany, the Benelux countries, Austria, Switzerland, and Algeria, is Mr. Edward Bartlett.

ORDERS WORTH approximately £250,000 for diesel-electric-locomotive gearing have been secured by the general gear division of David Brown Industries, Limited, Huddersfield. Part of the order covers the supply of about 70 sets of diesel-engine synchronizing gears of the spur type, case-hardened and profile ground to exceptional limits of accuracy. The rest of the order covers a large quantity of traction gears—case-hardened and profile-ground spur pinions and wheels of resilient design with hardened teeth. The new locomotives will be built at Derby for ultimate use by the Midland Region of British Railways.

Exhibition Aftermath

Comments, Illustrations and Conclusions arising at the Bingley Hall Foundry Show

Continuing and even surpassing the forecast of the JOURNAL'S first report on the Exhibition which was held in Bingley Hall, Birmingham, from May 21 to 30, the final week's showing was a revelation to all who participated, whether as standholders, Exhibition staff, organizers or visitors. The official

(Top left)—Friday, May 22, was the occasion of the visit to Bingley Hall of the official parties of the Council and principal officers of the Institute of British Foundrymen, and of the Worshipful Company of Founders. The illustration shows (from left to right): Mr. A. E. Peace (president, IBF), Mr. G. C. Paterson (president, Foundry Trades Equipment and Supplies Association), Mr. L. H. Durdin (immediate past-president, American Foundrymen's Society), Mr. G. W. Ilsley (Master of the Company) and Mr. H. S. Newton, (top right)—this group, taken when the Wales and Monmouthshire, and Bristol and West of England, branches of the IBF visited the Exhibition, includes (r. to l.): Mr. D. L. Richards (IBF junior vice-president elect), Mr. G. C. Paterson, Mr. N. P. Newman, Mr. R. B. Templeton and Mr. A. S. Wall; (bottom left) view from the FOUNDRY TRADE JOURNAL *stand in Bingley Hall; (bottom right) view from north corner of the hall, looking west.*

(left)—Mr. M. M. Hallett (senior vice-president of the Birmingham branch of the IBF) addressing the luncheon party during the official visit of the Birmingham branch; (right)—north corner of one of the bays at Bingley Hall, looking east.

figures for the attendances on the various days—not including the large numbers who came in parties on a single ticket, or who obtained admission unrecorded—are as follow: May 21, 576; May 22, 1,086; May 23, 2,041; May 25, 1,094; May 26, 1,623; May 27, 1,743; May 28, 1,768; May 29, 1,401, and May 30, 2,471. It is estimated that unrecorded admissions would show at least another 200 on these figures, making a total of well over 15,000, a figure of which everyone who has had anything to do with the Exhibition can be very proud. Overseas countries represented among the visitors totalled at least 27, nationals from the following countries being welcomed officially: Argentina, Australia, Belgium, Canada, Czechoslovakia, Denmark, Egypt, Eire, Finland, France, Germany, Holland, India, Israel, Italy, Japan, New Zealand, Nigeria, Norway, Pakistan, Rhodesia, South Africa, Spain, Sweden, Switzerland, USA and USSR. As was recorded in the June 11 issue (see *Leader,* page 681), the

(left)—"Getting down to it," a salesman explains a pertinent feature of his machine; (right) the official party, during their tour of the Exhibition, stop to watch a miniature cinema show, and listen to the commentary telling the story of how a foundry operates (just one of several admirable visual aids used in the Exhibition).

Right—Signing of a £16,000 order for a completely automatic foundry unit for producing small malleable castings (a scene photographed on the first day of the Exhibition).

Left—"Seen thro' the glass darkly", some members of the Council of the FTE & SA inspecting a showcase model of an automatic moulding plant.

astounding wealth of well-informed comment from even the humblest visitor on the products shown was one of the most remarkable features, and even in cases where no direct business accrued, every firm received on their stand large numbers of really technical foundrymen and were pleased to meet "in the flesh" many with whom they had corresponded with for years.

Around the Exhibits

Obviously it would be invidious to single out for special mention any particular exhibits from such excellent stands. There were, however, a number of machines and foundry supplies which were shown to foundrymen at Bingley Hall for the first time, and the majority of these will be featured in the JOURNAL'S "Equipment and Supplies" section in due course. Amongst these were automatic moulding machines and completely-automated plants, several new corebonding materials, coreblowers both for shell and ordinary cores, along with an infinite number of improved models. In

Other personalities present on May 22: (left-hand illustration) Dr. A. B. Everest (IBF past-president) with Mr. L. H. Durdin (AFS retiring president); (right-hand illustration) Mr. C. H. Wilson (extreme left), Mr. F. Webster, Mr. V. E. Upton, Mr. L. Sawers, Mr. G. Lambert (IBF secretary), Mr. T. Whitelaw (from Australia) and Dr. Everest.

Tasteful displays by models or "live" illustration were a feature of nearly every stand.

addition to the Association stands, there were those of manufacturers of apparatus ancillary to founding processes—for example, makers of showerbaths and wash-rooms, etc. The Clean Air Act also had its devotees in a great variety of exhibits designed for air (or other effluent) collection and purification. Great emphasis was also placed on methods for cleaning castings and making them more attractive in every way to consumer industries.

Emphasis on Evolution

The emphasis of the Exhibition was not so much on new models as on a wealth of detailed evolutionary development of existing designs of equipment. Added to this, there was a plethora of display devices ranging from "live" exhibits to animated models and ciné-films. It was as if each exhibitor had taken the Exhibition as a personal challenge to his ingenuity to show even mundane products in an eye-catching manner. Above all, this challenge for novelty had been taken up in friendly rivalry or co-operation with other standholders, according to whether the opposite numbers exhibited competitive or complementary products. This spirit of friendliness among exhibitors transferred itself immediately to all the visitors, so that each day's

View of the south corner of the hall, from the balcony.

View of the west corner of the hall, from the balcony.

gathering seemed to represent a large happy family of foundrymen, all enthusiastic about their vocations. Many exhibitors borrowed plant and equipment from each other and showed it to mutual advantage. In fact, this practice was so widespread that it called to mind an amusing cartoon of a stand on which were placarded examples of "borrowed equipment" in great number, while the standholder's own contribution was conspicuous by its insignificance! Again, it was quite usual for standholders to borrow useful apparatus one from another during the run of the Exhibition (one stand's representatives cooked their "hot-dogs" in the continuous oven on a neighbour's stand). To continue in the humorous vein, at one time the writer thought that a pendulum conveyor would have to be installed in Bingley Hall to carry the official catalogues around!

Many Customers

Joking aside, it is beyond any shadow of doubt that all of the thousands who visited the Exhibition, no less than the exhibitors themselves, carried away something of great value to their future work, the full benefit of which will be reaped over many years to come. In hard cash also, the exhibitors must be well satisfied with their efforts. In many cases, the whole of the plant shown on stands was sold before the Exhibition closed, and on every hand reports came in of hundreds of really worthwhile enquiries. The foundry trades' equipment and supplies business has been somewhat in the dol-

Problems were discussed man-to-man in a friendly atmosphere.

Mr. A. E. Peace (then IBF president) replying to the official welcome on Friday, May 22, with (seated l. to r.) Mr. C. H. Wilson and Mr. L. H. Durdin.

drums for a year or two, but this Exhibition seems to have marked a real upward turning-point in UK and overseas business.

Official Visits

In addition to the official parties recorded in the report of the Exhibition appearing in the JOURNAL of May 28, there were the following bodies represented on Friday, May 22—Birmingham Technical College, Institute of Vitreous Enamellers, Association of Bronze & Brass Founders, National Society of Master Patternmakers, Silica & Moulding Sand Association, Foundry Coke Merchants' Association, Vitreous Enamellers' Association, National Foundry College, Joint Iron Council, Council of Ironfoundry Associations, Board of Trade, and representatives of the national, provincial and technical Press.

Group of founders conversing on the opening day, May 21, (l. to r.): Mr. G. C. Paterson, Mr. G. W. Ilsley, Mr. James W. Early (president, J. S. McCormick Company, Pittsburgh, USA) and Mr. R. Sutcliffe.

Saturday, May 23, was the first official visit of the Birmingham branch of the Institute of British Foundrymen, led by their vice-president, Mr. M. M. Hallett. (Owing to the large number of Birmingham members wishing to attend, a second official visit was arranged for this group later that week.) Attending on the Monday were members of the Council of the National Society of Master Patternmakers, headed by their president, Mr. W. D. Hartley; members of the Bristol and West of England branch of the Institute of British Foundrymen, led by Mr. D. L. Richards (IBF junior vice-president elect); the Wales and Monmouthshire branches of the IBF, led by Mr. L. Duddridge (president), Mr. Randall, Mr. Hyde and Mr. A. S. Wall. On this day, also, 20 students from Cardiff Technical College were brought along by Mr. Kaye. Tuesday, May 26, saw visits by members of the Council of the Association of Bronze & Brass Founders, members of the Executive Council of the British Steel Founders' Association, and members of the Newcastle, Scotland, Tees-side and Sheffield branches of the IBF. Wednesday, May 27 was the date chosen for the second visit of the Birmingham branch of the IBF, and on Thursday, May 28, the following official parties were welcomed—the Executive Committee of the Joint Iron Council, of the Council of Iron Producers and of the Council of Ironfoundry Associations, the management committee of the National Foundry Craft Training Centre, and members of the Lancashire and West Riding of Yorkshire branches of the IBF. The official parties attending the Exhibition on Friday, May 29, consisted of members of the London branch of the IBF and members of the Executive Committee of the Light Metal Founders' Association. On the closing day, Saturday, May 30, the Exhibition organizers were pleased to welcome members of the East Midlands and Lincolnshire branches of the IBF.

Comment on the Exhibition

Reference has already been made in the JOURNAL to comment on the Exhibition by a leading manufacturer of German plant, and it is interesting also to record comment from two other quarters. The *Financial Times* occupied the width of three of its columns to proclaim "Wide Interest in Foundry Exhibition." Under this headline appeared the following—"The response to the Foundry Exhibition here in the first few days has been such as to merit consideration of widening its future scope to the international sphere." Among the compliments received one of the pleasantest came from Mr. L. H. Durdin, president of the American Foundrymen's Society, who, after a tour of the Exhibition, observed "this show hasn't been put on by a bunch of amateurs—these boys know what they are

doing." The views of one exhibitor put into a nutshell a fair reflection of the feeling of most of the firms participating in the Exhibition. He said, "This is, without doubt, the finest foundry exhibition I have ever seen anywhere—it is much better even than the Cleveland Show. Most important, it demonstrates the tremendous strides that this foundry-supplies industry has made during the past few years. In many respects, we are now taking the lead instead of having to follow the United States and Continental manufacturers. As for the visitors, who have been coming in every day in truly astonishing numbers, my experience—and it is that of all the exhibitors—is that they come here to talk business and to do business. The overseas interest has been particularly gratifying, and I am sure that for all of us the coming months will prove that in every respect this has been a first-class exhibition."

Conclusion

All thoughts are now turned to what the future will hold in the way of UK foundry exhibitions. Some are requesting further exhibitions on a local basis within a short time, but the general concensus of opinion is that three or four years must elapse before the majority of plant manufacturers will have anything substantially new to show. It is understood that in three or four years' time Birmingham may have a large new Exhibition Centre, and that some new hotels will have been built. If this is so, the only objection to holding a further foundry exhibition in Birmingham would be the seeming reluctance of foreign visitors to travel out of London.

Whatever is decided there is no doubt that foundrymen, having experienced the "taste of freedom" as a result of the Bingley Hall show, will not easily be led into merely sharing exhibitions with other organizations in the future.

China used Clay Moulds

The art of clay moulding dates back in China for more than 3,000 years, when fine bronzes which are famous all over the world were being made by that method. With the introduction of sand-mould casting, however, the art of clay moulding died out, excepting in the rural areas, where it remained in use for the local production of iron pots and pans, ploughshares, and other simple castings. Recent reports show that the method is now being vigorously re-popularized, because experience has shown that it can be applied to increase output and reduce costs. At the Tangshan Casting and Forging Plant, in Hopei Province, for instance, it is stated that clay casting has enabled the monthly output to be increased sixfold—from 0.27 tons, to 1.7 tons, per square metre of moulding area—in the past five months, without any increase of personnel or of moulding area, while at a foundry in Shanghai it has been said to be possible to reduce the cost of moulding to as little as 5 per cent. of what it used to be when dry-sand moulds were used there.

The report goes on to state that the technique of clay moulding is quite easy to master, and its products are of high quality. Each mould can be used for anything like between 50 and 200 castings. It has been taken up generally, therefore, in the foundries of Shanghai, Shenyang, Tientsin, Wusih and other places, for casting machine parts for metallurgical, mining, power and general machinery, and machine-tools. Experience with it over the past year has enabled improvements in technique to be effected, in particular by the introduction of practices derived from modern sand-mould casting.

Clay moulding is now being used for small and medium castings, for heavy castings weighing over 10 tons, for castings with walls but ½-mm. thick, and even for precision castings. It is claimed that its introduction is likely to contribute in important measure to the achievement of China's projected doubling in value of the country's output of machine-tools this year.

THE BRITISH CAST IRON RESEARCH ASSOCIATION announces that with effect from January, 1960, the BCIRA *Bulletin and Foundry Abstracts* will be incorporated with the BCIRA *Journal of Research and Development* and the new publication will be henceforth known as the BCIRA *Journal*. Publication will be bi-monthly as before.

"Wasters" due to Faulty Running

By "Coroner"

Techniques employed in the country jobbing foundry are often different to those practiced in a production shop. In some cases these jobbing foundry methods are justified, but on many occasions they tend to cause scrap castings, or "wasters."

The writer was recently consulted about a batch of castings of a simple nature, a percentage of which were scrapped. The castings were solid lumps, 3-in. sq. by 2½-in. deep, with a boss 2-in. dia. and ¼-in. deep on the bottom face as-cast. The complaint was that, on machining the top face of the castings, a number had exhibited gas-holes about ¼-in. below the surface. As each casting was provided with a heavy self-feeding riser the reason for the defect was not at first apparent.

On investigation, the writer learnt that four castings were made in one box, each casting being poured individually through its self-feeding riser. This gave a clue to the cause of the trouble, and it was eventually determined that, after the first casting had been poured, the gases in the adjacent sand expanded and travelled through to the adjoining mould-cavity. The speed of transit of this gas was such that it did not affect the second and third castings poured, but, by the time the last one was cast, sufficient gas had percolated into the fourth mould to cause trouble, since the mould was poured through the riser and thus tended to trap the gas in the mould.

Experimental work revealed that if each of the four feeders was connected to a common runner, so as to fill each cavity at the same time, better results were obtained. After further research, it was found that if a block runner was used which just touched each of three castings and dispensed with the feeders, then trouble-free castings resulted. Furthermore, the yield was increased because of the saving in feed metal.

THE IRANIAN MINISTER OF CUSTOMS AND MONOPOLIES has issued a statement to the effect that any goods sent to Iranian posts in the Persian Gulf which are marked, or accompanied by documents "Arabian Gulf" (*i.e.* instead of Persian Gulf) will be unacceptable to the Iranian authorities and the unloading of such goods will be forbidden.

ESC's Largest Casings

The first pair of two identical sets of cast-steel steam-turbine casings, ordered by Metropolitan-Vickers Electrical Company, Limited, from English Steel Castings Corporation, Limited, was despatched recently from ESC's Grimesthorpe Works in Sheffield. A second pair was then being fettled and pickled, and is scheduled for delivery this month. The casings are to be used in the two largest single-axis turbine-generators ever to be built by Metropolitan-Vickers. Rated at 200 mw. and 3,000 r.p.m., they are amongst the largest-capacity machines of their type in this country and are destined for the Central Electricity Generating Board's new Willington "B" power-station, which will be situated adjacent to the river Trent, south of Derby.

Difficulties of Manufacture

The casings break ESC records, since although not the heaviest, they are almost twice the size of any turbine casings previously manufactured. ESC technicians say that the manufacture of these casings was a much more difficult assignment than that of producing say a 185-ton steel casting, as, in addition to the intricacy of the job (particularly in the coremaking), they had continually to bear in mind that the casings would be required to resist operational temperatures and pressures far in excess of those allowed for in previous jobs of this type. With the moulding of the two bottom sections an unusual procedure had to be adopted: the pattern was rammed whilst upside down, the box rolled over, the pattern removed, and the mould then lowered into the pit (see Fig. 1).

Dimensions and Inspection

The top sections, which contain an integral steam chest, weigh 13 tons 7 cwt. in rough-machined condition, and the bottom sections 11 tons 8 cwt. Because of their unusually large dimensions the casings were cast in pits from moulds prepared in boxes. When assembled, the casings are 11 ft. 1 in. dia. by 9 ft. 2¼ in. long (the two sections fit together to enclose the turbine rotor and blades). After machining (Fig. 2), the first pair underwent exacting X-ray, gamma-ray and magnetic crack-detection tests, after which the customer's inspector announced that he was completely satisfied with the results of this rigorous examination.

* Based on information published in the ESC *Information Bulletin*.

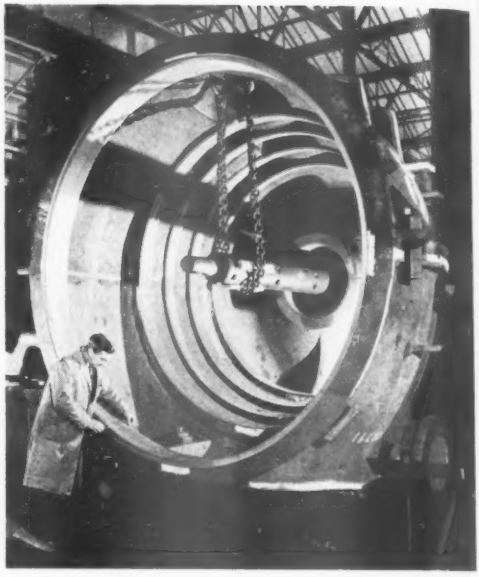


FIG. 2.—*One of the casings in the Hawke Street planing shop of English Steel Corporation, Limited, Sheffield, after rough machining.*

FIG. 1.—*Craftsmen at work in the Grimesthorpe foundry of English Steel Castings Corporation, Limited, Sheffield, on one of the moulds for the record cast-steel steam-turbine casings. The man shown is making up vents from one of the large cores. Before closing the mould much preparatory work of this nature is entailed to prevent entry of metal at joints, etc.*

Bridging the Gap

During the past few weeks, whilst negotiations have been going on to settle the printing dispute, the accumulation of news of day-to-day events in the foundry industry has mounted up. It is thought that readers need to be informed of the happenings during the unavoidable break in publication, and whilst it would be impossible to report each item individually, an attempt to "bridge the gap" has been made in the following condensed summaries. It is hoped that in this way the accumulated news will be rendered into a palatable whole in such a manner as to avoid mental indigestion.

Meetings, Exhibitions, Courses, etc.

Although most institutions and associations discontinue meetings during the summer months, news comes from the ASSOCIATION OF BRONZE AND BRASS FOUNDERS of a meeting of members of the Lancashire and Cheshire area at the Engineers' Club, Albert Square, Manchester, in June, when Mr. G. H. Charsley addressed the assembly on the subject of recruitment and training in the foundry industry. Another meeting was that of the Australia (Victoria) branch of the INSTITUTE OF BRITISH FOUNDRYMEN, when Mr. J. Fram of the International Harvester Company, and Mr. W. Kneen, United Malleable Company, dealt with different aspects of "Machine Moulding." The INSTITUTE OF INDIAN FOUNDRYMEN held its ninth annual general meeting in June at the India Exchange Place, Calcutta. The Hon. Sardar Swaran Singh, Union Minister for Steel, Mines and Fuel (Government of India), addressed the opening session, and during the session, Dr. B. R. Nijhawan, PH.D., F.I.M., F.N.I., was inducted into the chair by Mr. N. G. Chakrabarti, the retiring president. A record number of foundry technologists, high officials of the Government of India, presidents of Chambers of Commerce, etc., attended the meeting.

A very interesting exhibition of pressure-die-castings was held for one week in June at the ENGINEERING CENTRE, Birmingham. Exhibits included castings from Britain and many European countries and the organizers of the exhibition—the Zinc Alloy Die Casters Association and the Light Metal Founders Association—are to be congratulated on their production of a very successful show. In July two exhibitions were held at the Centre, one organized by Square D, Limited, of London, and the other by the Building Centre. At the British Industries Fair, held in Lisbon, the Engineering Centre organized a successful group display at which the products of 25 British firms were on show. Among inquiries received were several for heat-treatment furnaces, electrically-driven air compressors; anodized aluminium castings and centrifugal casting machines for ferrous cylinder-liners. It is announced that a list is obtainable from the Centre, of Portuguese importers and agents who would like to represent British firms for the following products: pipe-fittings, centrifugal casting machines, cooking ranges, washing machines and refrigerators.

The latest news of the GEORGE KENT MOBILE EXHIBITION is that its current overseas tour will include a visit to the steelworks of Empresa Nacional Siderurgica S.A., at Aviles, Spain, where a course in the Kent company's customer training system is expected to be in progress, and the exhibition will have the new and unusual rôle of "ambassador."

At a refresher course held recently by FERRO ENAMELS, LIMITED, Ounsdale, Wombourn, Wolverhampton, the following papers were presented:—"New Enamels and their Uses," by Mr. A. H. Symonds; "Dry Process," by Mr. E. A. Lawton; "Application Procedure," by Mr. A. T. Issitt; "Subsieve Particle Size," by Mr. J. F. Brown; and "Detergent Tests and Detergent Resistance of Enamel Finishes," by Mr. F. G. Morriss. Presumably copies of the papers are available from the company at the address quoted. Excellent courses in metallurgy are detailed in the prospectus for 1959-1960 of the SIR JOHN CASS COLLEGE, Jewry Street, London, E.C.3, which is now available.

Orders Received

Orders worth more than £1,000,000 have been recently received by several companies, amongst them being the CLEVELAND & ENGINEERING COMPANY, LIMITED, Darlington, who have been awarded a £1,346,099 contract for a steel-and-concrete suspension bridge across the river Tamar, near Plymouth. The bridge is expected to be completed in 1961. A £1,250,000 contract has been received by the GENERAL ELECTRIC COMPANY, LIMITED, who will be the main contractors for a complete iron-ore preparation plant at the Redbourn Works of Richard Thomas & Baldwins, Limited, at Scunthorpe. PRATT BROTHERS, LIMITED, of Oldham, is yet another company to secure an order to the value of more than £1,000,000; this is for textile machinery for Poland, and is reported to be the largest yet received for British textile machinery for Poland.

A contract to build a lead- and zinc-treatment plant at Cockle Creek, near Newcastle, New South Wales, has been won by the Australian subsidiary of the Simon-Carves engineering group in Britain, SIMON-CARVES (AUSTRALIA) PTY., LIMITED. F. H. LLOYD & COMPANY, LIMITED, has submitted a tender to the Indian Railway Board, under which the company will accept responsibility for the design and operation of a steelfoundry at Chittatanjon, West Bengal. It is understood that the tender has been accepted. A Dutch firm, N. V. KONINKLIJKE MAATSCHAPPIJ 'DE SCHELDE,' of Flushing, has received an order from the Royal Mail Lines, Limited, of London, for the reconstruction of the passenger vessel Andes. An order worth more than £250,000 has been placed by the Polish organization, Varimex, with Prince Smith & Stells, Limited, textile-machinery makers, Keighley, for worsted and synthetic spinning machinery.

In face of strong competition from Continental firms, the FALKIRK IRON COMPANY, LIMITED, has been awarded a contract for the gas-fired cooking equipment and stainless-steel appliances for the kitchen and cafeteria at the new permanent headquarters of NATO, at Dauphine, France.

Extensions

Reports of companies extending their businesses concern the AUDLEY ENGINEERING COMPANY, LIMITED, which is opening new premises at Gloucester and on Merseyside. At the company's Newport plant, where some 900 are employed, production is to be expanded. One of the George Cohen 600 group of companies, GAMET PRODUCTS, LIMITED, has also opened a new factory. It is located at Hythe, Colchester, and manufacture will be solely of highly-specialized precision bearings for the machine-tool industry. At Glenrothes, Fife, a new factory has been opened by ANDERSON BOYES & COMPANY, LIMITED, coalmining-machinery manufacturers. The BRUSH ELECTRICAL ENGINEERING COMPANY, LIMITED, is reported to be purchasing the rotating-machines section of Verity's, Limited, Birmingham, which company recently went into voluntary liquidation. Manufacture of the machines

Bridging the Cap

will continue at Birmingham for the time being, but eventually will be manufactured at the Brush works in Loughborough.

From America came the news that the MAGNET COVE BARIUM CORPORATION (Magcobar), Houston, Texas, is nearing the completion of the construction of a new sales office and foundry research building at Tolling Meadows, Illinois, USA. Magcobar, one of the Dresser Industries, produces western and southern bentonites for the foundry industry.

Business Briefs

Quite a number of reports of company activities reflected increased business. For example, the managing director of Rootes, Limited, MR. BRIAN ROOTES, has announced that the company is stepping up production at its Melbourne plant by 40 per cent. to keep pace with demand. At the DISTINGTON ENGINEERING COMPANY, LIMITED, Workington, where a four-day week had been in operation since May, employees were reported recently to be back on a five-day week, and this is expected to continue for some time. BRITISH MONORAIL, LIMITED, Brighouse, Yorkshire, has recently concluded new technical liaison and licensing agreements with American Monorail Company, Cleveland, Ohio, USA. The negotiations were carried out, during a visit to the USA, by Mr. Eric Russell, sales director of Herbert Morris, Limited, the Loughborough crane manufacturers, who recently purchased a controlling interest in the company.

The gross profit made by GENERAL MOTORS-HOLDENS, LIMITED, Australia, reached the highest figure in the company's history, nearly £A30,000,000. A net profit of over £A15,250,000 was declared after allowing over £A11,000,000 for taxation and £A3,750,000 for depreciation. Total sales for 1958 were worth £A116,000,000. TELECAMIT, LIMITED, have bought all the shares in Industrial & Domestic Heaters, Limited, and also purchased a majority interest in British Oil Burners, Limited. Following acquisition of these two businesses, Mr. P. R. Scutt, managing director, and Mr. H. E. Jackson, chief engineer of Tecalmit, Limited, have been made chairman and director of the companies; Mr. James R. C. Boyce, will continue in his position as managing director of both companies, and Mr. K. Sheridan has been appointed sales director of Industrial & Domestic Heaters, Limited.

The UNITED STEEL COMPANIES, LIMITED, of Sheffield, have become shareholders in Concast A.G. of Zürich, as have also the Schloemann Company of Düsseldorf, and the Campagnie des Forges et Acieries de la Marine et de St. Etienne S.A., Paris. Mr. G. N. F. Wingate, director and general manager of Distington Engineering Company, Limited (a United Steel subsidiary) has joined the Concast board and other new members are Dr. H. C. G. Losch,. of Krefield, Dr. B. Knapp, of Düsseldorf, and Mr. Henri Malcor, of Paris. The chairman is Mr. Irving Rossi of New York. A reciprocal trading agreement is announced between AMBER CHEMICAL INDUSTRIES, LIMITED, 11a, Albemarle Street, London, S.W.1 and the D. A. Stuart Oil Company, Limited, of Chicago and Detroit (in association with Canadian D. A. Stuart). In consequence of this arrangement, which operates from August 1, Amber Chemical Industries is appointed sole distributor and licencee in the UK, Eire, South Africa, Australia and New Zealand for all the products of D. A. Stuart.

FROM JUNE 30 to July 2, a Swiss delegation visited London to discuss trade arrangements for the rest of 1959. Quotas for goods still subject to restrictions were reviewed and some increases were agreed. During 1957, Columbia imported US$66,000,000 worth of iron and steel and manufacturers, representing 13.6 per cent. of the country's total imports. According to *L'Usine Nouvelle*, France exported to Great Britain, during the first five months of this year, 166 *tonnes* of malleable-iron tube fittings. In June, Sheffield University Court approved an ordinance affiliating colleges to the University for granting Master's degrees in pure science, engineering and metallurgy. The Colleges are the Sheffield College of Commerce and Technology, Barnsley College of Technology, Chesterfield College of Technology, Doncaster Technical College, Grimsby College of Further Education, North Lindsey Technical College and Rotherham College of Technology. The scheme will start in October.

TO ENCOURAGE YOUNG CHEMISTS to investigate and develop new analytical methods, the Midland section of the Society for Analytical Chemistry is organizing a competition. It will be for scientists who are under the age of 30, and who work in the Midlands. The competitor sending in the best paper on analytical chemistry will receive a trophy—a silver cigarette box—donated by Mr. W. T. Elwell, divisional analyst of Imperial Chemical Industries (Metals), Limited, Witton, Birmingham. From Wellingborough, Northants, comes news that a small fire at Morris Motors' foundry on July 4, destroyed 60 ft. of rubber conveyor belting contained in a ventilation duct.

AT THE INTERNATIONAL INDUSTRIAL FILM FESTIVAL held in Turin, in June, the United Steel Companies film "Steel Town" was placed first in its class. (A review of the film was published in the JOURNAL in the May 14 issue, page 556.)

In a case for damages brought by Mr. James Bingham, an instrument fitter, against Firth Brown Tools, Limited, Carlisle Street, Sheffield, Mr. Bingham said that in stepping to one side of a gangway his coat caught a 12-in. steel bar, causing dislodgement of this and another bar, and his right ankle was struck. He thought the protruding bars were dangerous. The labour manager for the firm, Mr. Keith Wainwright, said the minutes of the works safety committee revealed that no complaints about protruding bars had ever been registered. Judgment was given for the firm and Bingham ordered to pay costs.

A FOREWARNING is given by the National Association of Glove Manufacturers of an increase in the cost of leather goods, including industrial gloves, during the next few months. Apparently world prices of hides and calfskins have advanced up to 100 per cent. and more as compared with prices in July 1958, and for goat, sheep and other skins there has also been a considerable increase in price. The main causes are said to be the higher standard of living in many countries causing increased demand, heavy increases in purchases of hides and leather by Russia and satellite countries and Japan, and supplies from Argentina, America and other countries being greatly reduced.

A party of 12 French apprentices and two members of the staff from the Societe des Fonderies de Pont-a-Mousson (an ironworks at Nancy in France) visited the Stanton Ironworks Company, Limited, near Nottingham, on July 14. In the evening Stanton apprentices took the French visitors on a sightseeing tour of Nottingham, and afterwards, they were all entertained to dinner by the company. The Stanton boys visited the French works during a tour of France, Holland and Germany at the end of July. Further news from Stanton is that a new £4,000,000 iron-ore preparation plant is to be opened on October 1 by Mr. A. G. Stewart, chairman of Stewarts and Lloyds, Limited. More detailed information about the plant will be given in a future issue of the JOURNAL.

Institute of Metals

Autumn Meeting in Scandinavia

The 1959 autumn meeting of the Institute of Metals will be held in Sweden by invitation of Bolidens Gruv A.B., A.B. Svenska Metallverken and the Metallografska Institutet, with an extension to Denmark by invitation of the Danish Society of Metals. The meeting will open in Stockholm on Monday, September 21, and continue there until Friday, September 25. Those taking part in the visit to Denmark will leave for Copenhagen on the evening of the 25th.

Programme

A very attractive programme of technical sessions, works visits, ladies social outings, and social functions has been arranged. The technical sessions, to be held at Kungl. Teknisk Högskolan (Lecture Theatre), will commence with the autumn lecture to be given by Professor E. Rudberg, director of Metallografiska Institutet. At other sessions papers to be discussed will have the general themes of "Production of Fine Copper Wire for Enamelling" and "Corrosion of Aluminium" while sessions devoted to individual papers will deal with "Volume Increases in Fissile Materials on Neutron Irradiation and the Effects of Thermal Fluctuations" and "Extrusion in Comparison with other Methods for the Manufacture of Rod and Wire in Copper and Copper-base Alloys."

About fourteen works and research institutions are being opened for inspection including A.B. W. Dan Bergman (Wedaverken), Södertälje, manufacturers of aluminium and magnesium castings and pressure- and gravity-die castings; A.B. Atomenergi (research laboratories); laboratories of the Metallografska Institutet Teknisk and Kungl, Teknisk Högskolan; Aga (beacons. lighthouse equipment, stoves); A.B. Electrolux (vacuum cleaners, polishers, kitchen machines); A.B. Svenska Metallverken, Vasby (zinc and aluminium-alloy die-castings, hot pressings in brass; foil and injection mouldings); Stora Kopparbergs Bergslags A.B., Falun (copper mine and museum of mining), and Domnarfvets Jernwerk. Danish works visits include A/S Burmeister and Wain's Maskin og Skibsbyggeri (large diesel engines); and the Department of Metallurgy, Royal Technical University. During the visit to A.B. Atomenergi, at Studsvik, a technical session will be held at which the following papers will be presented and discussed:—"Swedish Research on Aluminium Reactor Technology," by Mr. Forsen, and "Welding of Aluminium for Reactor Use" by a member of A.B. Svenska Metallverken.

The social side has been well catered for by the inclusion of sightseeing tours, a cocktail party, banquet and dance, a Council dinner, and a visit to the Royal Palace and City Hall. For those going on to Denmark visits have been arranged to the National Museum, Kronborg Castle, the Royal Porcelain Factory, and other places of interest.

As it is impractical for a large number of people to travel to the meeting on the same day unless special arrangements are made, Thos. Cook & Son, Limited, have been appointed as the Institute's agents for travel, accommodation and certain essential services. A registration fee will be charged in the case of each member and guest registered for the meeting, and while it has not yet been possible to definitely assess this, it will probably be in the region of £12.

Dowlais Foundry Bi-centenary

Saturday, September 19, will mark the bi-centenary of the modern ingot-mould foundry at Dowlais, in Wales. Two hundred years before, to the day, articles of co-partnership in the original blast furnace were signed by nine partners, who had a capital of £4,000 (a real fortune in those days). The original plant was called the Myrthy Furnace," and the proprietors were committed to "joint dealing in the Art, Misterry, Occupation and Business of an Iron Master and Iron Manufacturer." The first plant manager was Mr. John Guest, who left his home town of Broseley, Shropshire—where he combined the unusual pursuits of farmer, ironfounder, brewer and coal dealer—to manage the new works in 1760. His family name is still linked with the owner company, Guest Keen Iron and Steel Company, Limited.

To-day, hematite-iron ingot moulds up to 30 tons in weight are made at the Dowlais foundry, along with grey-iron castings weighing up to 20 tons, and copper and copper-base alloy castings up to 2 tons. A £250,000 modernization scheme was completed in 1952, and the foundry now supplies all the ingot moulds for the company's steelworks in Cardiff, and more than half the moulds needed at the Port Talbot works of the Steel Company of Wales, Limited. The weekly capacity of the ingot-mould foundry is now 1,000 tons, and will increase considerably if shift working is adopted. To commemorate the bi-centenary the company has issued the "Dowlais Story" an illustrated record of the history and progress of the enterprise. Additionally, there was a visit to the works by members of the technical Press and, in particular, a tour of the new ingot-mould foundry which is to be described in the JOURNAL shortly.

New Creep Information Centre

In response to requests from manufacturers and users of high-temperature materials, a Creep Information Centre is being set up at the National Engineering Laboratory (formerly the Mechanical Engineering Research Laboratory) at East Kilbride, so that industrial designers can more readily obtain data on the strength of high-temperature materials. The main objective of the Centre will be to collect and tabulate all the available data on creep and rupture properties of conventional high-temperature materials. Data for British materials will be issued in an agreed form as far as considerations of commercial security allow. The scheme will later be extended to include fatigue and other mechanical properties of high-temperature materials and information about test procedures and testing machines; data on foreign materials may also be included. A leaflet giving further details of the scope of the Creep Information Centre is available from the Laboratory. All firms and research organizations concerned with the production or use of high-temperature engineering materials are invited to participate, and to write to the director, National Engineering Laboratory, East Kilbride, Glasgow.

AN ARTICLE on the lining of cupolas, appearing in the May issue of the *Journal d'Information Techniques des Industries de la Fonderie,* suggested that where monolithic linings are used a double layer of corrugated cardboard should be interposed between the lining and the furnace casing.

New Catalogues

Corrosion-resisting High-silicon Iron Alloys. In publication Sm/1/59, L. G. B., Bradley & Foster, Limited, Darlaston Iron Works, Darlaston, Staffs, detail a wealth of technical information on this very interesting series of high-silicon iron alloys. Actually this Hypersilid range covers three alloys with the silicon increasing from 11 to 17 per cent., and the carbon decreasing from 1.10 to 0.35 per cent. Details are given as to the preparation of the metal and a microstructure is reproduced, but, unfortunately, without the magnification being stated. Whilst compared with ordinary cast iron the Hypersilid alloys have less strength, they are much stronger than their main competitor, earthenware. The reviewer remembers Dr. Hurst, who has done much to develop this material, saying that if the material cooked like earthenware instead of cast iron, breakages would be enormously decreased. The uses of high-silicon iron alloy are set out in page 11 of the brochure and are much greater than the man-in-the-street would realize. The pattern contraction allowance for Hypersilid is $\frac{3}{16}$-in. per ft. Table 3, printed on page 17, gives the relative attack or lack of attack by a series of acids. The booklet concludes by recounting the requirements of these irons covered by British Standards specifications.

Steel Recuperators. R 59/12 E is the reference number of a 16-page catalogue issued by Metallurgical Engineers, Limited, 5-15, Cromer Street, London, W.C.1, covering heat-exchangers and heaters for air and gases. Of these there are numerous types with various metallurgical applications. The first two, the classical and channel recuperators, seem mainly to have heavy-duty or blast-furnace applications, where only slightly dusty gases are handled. The next one to be described is the flue-tube recuperator, which is designed for handling dust-containing gases and this is the type used in connection with the hot-blast cupola. Other types described and illustrated are radiation; combined radiation and convection; and combined concentric recuperators. The various systems described make an interesting comparative study of heat recuperation under diverse circumstances.

Silica Sands. A folder issued by British Industrial Sand, Limited, Holmethorpe, Redhill, Surrey, in an extensive table details the grade, type, chemical composition and sieve analyses of ten sands and the availability of these from three different quarries. With this folder came foundry data sheets 1 to 4, covering respectively the properties and applications of Redhill F and H and Lynn 4F and SS sands.

Resin-coated Sands. Feslente, Limited (a subsidiary company of British Industrial Sand, Limited), Holmethorpe, Redhill, Surrey, in *Technical Bulletin 6*, detail the properties obtained when using various grades of Redhill and Kings Lynn sands coated with resin for use in shell-moulding and -coremaking. In addition, optimum figures are given for a number of the factors involved in mould and coremaking.

Hard Pattern Plasters. Foundry Services, Limited, Long Acre, Nechells, Birmingham, 7, in leaflet No. M9, give very full instructions for the mixing and use of Pattrex—the name given to a range of hard plasters for making patterns, patternplates, oddsides, models and coreboxes.

House Organs

Sirocco Record, Spring, 1959. Published for private circulation only by Davidson & Company, Limited, Sirocco Engineering Works, Belfast, Northern Ireland.

This is a well-produced magazine designed to be of interest to the company's staff; social events, however, are kept within bounds. The more important activities, such as the formation of new agencies and subsidiary companies, are well covered, and a comprehensive list detailing the composition of the company's staff at the various branches is included. The contents are well balanced and cover some historical notes, various developments in the shops, such as X-ray services and torsion-meter tests, and a description of the Sirocco foundry by Mr. V. C. Faulkner, extracted from the JOURNAL. Altogether this magazine is a pleasing publication.

Wiggin Nickel Alloys No. 51. Issued by Henry Wiggin & Company, Limited, Thames House, Millbank, London, S.W.1.

The issue features the use of nickel in the manufacture of a tank for the transportation of phenol by road, and a description is given of how AT nickel is used to protect the purity, and therefore the colour, of phenol. Also featured in this issue is the use of steel plates clad with nickel or Monel in the construction of heavy items of chemical plant. Other articles include the uses of nickel-containing materials in fast passenger launches; high-speed steam-cleaning units; and a review of high-temperature brazing equipment.

Die Casting News No. 2, published by the Zinc Alloy Die Casters' Association, 34, Berkeley Square, London, W.1.

This issue shows very clearly how machine-tools and other machines are now being built up from aggregations of zinc-alloy die-castings. Very impressive is the picture of the Selector Home-master Workshop, which mainly shows a portable electric drill and some gadgets for use with it. It carries 15 zinc-alloy castings weighing 11 lb. The whole is a very interesting and convincing bulletin.

Monsanto Mail, No. 3. Published by Monsanto Chemicals, Limited, 10-18, Victoria Street, London, S.W.1. This very-well-produced and brilliantly-illustrated magazine is designed to interest the general public and in this it is remarkably successful. For instance, an answer is given to those dissatisfied with the appearance of the rolling stock on British Railways. Other articles deal with ice cream, kitchen ware and so forth.

CORRESPONDENCE dated June 18 indicates that Dhingra Engineering Works, founders and engineers of 7/9, Luxman Bagh, Kanpur, India, are inviting tenders for the supply of tools and equipment including the following:—Pneumatic moulding machines of various sizes capable of moulding iron castings of up to 2 cwt. and jobs of diameters 24 to 36 in.; die-casting machines for parts of up to 14 lb. in weight; tilting furnace of 5 cwt. capacity; core-making machines; saw machine for steel; flexible grinding machine; coal-, coke- and oil-fired furnaces; die-steel casting equipment; electric furnaces with working temperatures of 1,600 deg. C. or more (various sizes and types) for steel melting and steel castings; electric furnace for heat-treatment; furnaces for malleable casting to be erected at site; air compressors and centrifugal casting machines and ancillary equipment. Interested parties should request details of requirements direct from the firm.

ABBF Apprentices' Competition

Fourteen apprentices from seven firms in London and the Home Counties recently took part in a competition run by the Association of Bronze & Brass Founders (London Area). The competition was held in order to stimulate the interest of apprentices generally and, in particular, to prepare candidates from the bronze and brass side of the foundry industry for the International Foundry Apprentices' Competition, which is to be held in this country next year.

The apprentices' competition organized by the ABBF (London Area) this year consisted of two separate parts —practical and written. Each candidate was provided with identical pattern equipment and allowed to produce his casting in the foundry of his employer. This casting was made under the supervision of the management concerned, who undertook that the work was carried out by the apprentice entirely unaided. The castings were judged by an independent panel of three practical foundrymen and technicians at the Borough Polytechnic on April 22, 1959. The members of the panel were Mr. Bicknall (foundry manager, Stanton Iron Works); Mr. F. Hudson, F.I.M. (Mond Nickel Company, Limited), and Mr. D. Morris (foundry manager, Vickers Armstrong). (See Fig. 1.)

Not only was the competition a test of practical foundry skill—including the ability to plan methods of moulding, core-making, running, risering and casting—it also included a three-hour written paper on technology, calculation, and the interpretation of technical drawings. This written examination also took place at the Borough Polytechnic, by kind permission of the principal, Dr. Garside. Competitors were allowed to use whichever yellow metal they favoured, and those used included aluminium-bronze, high-tensile brass, Admiralty gunmetal, commercial gun-metal and phosphor-bronze. The age of each competitor was taken into account in judging the castings, and to arrive at the final results a ratio of 65 per cent. practical: 35 per cent. written was allocated.

The results showed that most competitors were reasonably good in their practical work, but not well-advanced in their written papers. That being so, it was decided to introduce a low-mark limit on both practical and written tests, below which a competitor would not be eligible for a place. These limits were 60 per cent. for practical, and 35 per cent. for theoretical—the latter lamentably low, but necessary to enable the first three places to be filled. Although only three boys qualified for places in this competition it has been felt fair to award consolation prizes to two competitors—one with the second-best casting, the other having the second-best paper. Full results are given

TABLE 1—*Prizewinners in the ABBF Apprentice Competition.*

Apprentice.	Practical results.			Written results.		Final mark (per cent.).	Position.
	Marks possible, 360.	Total percentage.	65 per cent. of total.	Total percentage.	35 per cent. of total.		
P. Bonson (Langley Alloys, Ltd.)	231	64.1	41.66	80	28	69.66	1st.
K. Chambers " "	267	74.1	48.16	35	12.25	60.41	2nd.
F. Ferreira (Anti-Attrition Metal Company, Ltd.)	238	66.1	42.9	47	16.45	59.35	3rd.
Consolation Prizes.							
Second-best Written Paper: C. A. Cooley (Hilger & Watts, Ltd.) ..	203	56.4	36.66	68	23.8	60.46	—
Second-best Casting: M. Puddephatt (George Kent, Ltd.) ..	240	66.6	43.2	21	7.35	50.55	—

N.B.—In order to qualify for a place candidates had to obtain minimum marks as follows:—Practical: 60 per cent., written: 35 per cent.

FIG. 1.—*Organizers examining some of the castings produced during the ABBF local apprentices' competition, held in London; (from l. to r.) Mr. W. R. Buxton, Mr. F. Hudson,* F.I.M., *and Mr. D. Morris.*

FIG. 2.—*Castings produced by the first three prizewinners during the ABBF competition; (left) casting made by P. Bonson (first prize)—weight 44 lb., metal BS 1400 AB2; (top left) K. Chambers (second prize) made this one, also in BS 1400 AB2, and (above) casting, weight 34 lb. in BS 1400 PB1, made by F. Ferreira (third prize).*

in Table 1, and Fig. 2 shows the castings submitted by the three winners.

Prizegiving

The prize distribution was held at the Clarendon Restaurant, Hammersmith, on Tuesday, June 24, and was preceded by a dinner to which all competitors were invited. The prizes consisted of a diploma and wristlet watch for first place, certificates and a copy of the book "Modern Foundry Practice" for second and third, and two consolation prizes of copies of "Modern Foundry Practice." In his address, Mr. W. R. Buxton (chairman of London-area ABBF members) said that if the British bronze- and brass-founding industry was to maintain its leadership in the engineering field it would require a large number of skilled craftsmen, who must continue to strive to produce high-quality goods. Although there was a lot of talk about automation, with its monotonous repetition, there was still a future for boys who were prepared to learn in the foundry and in the classroom how to tackle the problems facing the industry. Mr. Buxton then asked Mr. A. J. N. Brown (president of the Association) to present the prizes.

Mr. Brown, in presenting the prizes to the winners, said how pleased he was to see the gathering so well attended; and how encouraging it was that this first competition had had such support from the apprentices. It was a credit to Mr. Buxton that so many young men had entered, and he sincerely hoped that other areas would consider the idea as well. Mr. Brown then made the presentations.

Slides were shown of the winning castings, and Mr. F. Hudson, F.I.M., one of the judges, led a discussion on these, explaining the system of marking used and giving advice to competitors for future guidance. He detailed some of the difficulties which had faced the judges, and made some observations on various castings which had been produced. He explained that it was a special casting of an unorthodox design. Mr. Hudson went on to say that in a foundry there were always two types of moulder: the one who made anything he was given, and the one who considered the pattern which was submitted and, if he thought fit, asked for some modifications to be made to it to make founding easier, to ensure a better quality product. Mr. Hudson said that he was certain that those belonging to the latter type would have the more successful future in the industry. One question put to Mr. Hudson queried the use of different alloys by the competitors. It was explained that this ruling was made to enable apprentices to choose the alloy they knew best how to handle. The question of arranging competitions where only one metal would be used would be considered for the future.

The final speaker was Mr. A. R. French, who had set the written paper. He stressed how important theoretical

work was, and how much he regretted that it had not been of a higher standard in this competition. He also stressed that, in the changing conditions of modern industrial life, it was essential that a good founder should "know all," and not only be a good moulder, but also know something about the drawings, patterns, sand, and metal—in fact, all aspects of a foundryman's life.

Acknowledgments

The ABBF members wish to express their thanks for the ready assistance given to them by the Institute of British Foundrymen (London branch), whose pattern equipment and rules were used; Dr. Garside and members of the staff of the mechanical engineering department of the Borough Polytechnic, for the use of their foundry and facilities for the written paper, and for the assistance given by Mr. Pyemont and Mr. Smellie. The Association also wish to thank the judges, and their companies for allowing them to give their time in this matter, and in addition, the Anti-Attrition Metal Company, Limited, and the Eyre Smelting Company, Limited, who subscribed the money to buy the prizes.

The success of this first essay of the ABBF into the world of competitions leads the members of the committee of the London area (Mr. W. R. Buxton, Mr. A. R. French, Colonel Holt and Mr. A. Talbot) to hope that other areas will continue the good work, and enable "British Bronze" boys to put this country where it belongs in international competitions, *i.e.*, at the forefront.

BISRA "Open Days"

The British Iron and Steel Research Association is planning two "open days" at their laboratories at Battersea Park Road, London, S.W.1, on October 22 and 23. The Battersea premises house the laboratories of the Association's plant-engineering and energy division, and the departments of physics, chemistry and operational research. Each of these departments will mount a display and visitors will be able to see some of the extensive work being done on electrical control and recording including, for example, the "Tallimarker" apparatus, one of the latest developments in information handling; testing of girder and gantry structures; a number of projects relating to the handling of bulk materials, and hydraulic and other control systems for steelworks plant, and displays relating to an enquiry into the fuel consumption of the industry. The metal-physics section will show something of the continuing investigations into the problem of combined creep and fatigue, whilst the chemistry department will be "highlighting" the work of its physical chemistry, corrosion and refractories sections.

Besides the Battersea premises, BSIRA's London group laboratories include part of the ironmaking division housed at the Imperial College of Science at South Kensington, and a special display of one of the most important projects of this division is being prepared to illustrate the principle of the recently-developed SCICE (stationary charge in controlled environment) apparatus.

Those wishing to attend the "open days" should make early application to the information officer of the Association at 11, Park Lane, London, W.1.

NEW BINDERS for Ciba (A.R.L.) Technical Notes are now available from Ciba (A.R.L.), Limited, Duxford, Cambridge, at a cost of 6s. 6d. each, post free.

Cast-iron Water Wheels

By C. J. Robb

The water-wheel was a feature of old-time rural industry, and before the introduction of cast-iron allied with wrought, the undershot wheel made principally of wood with radial floats provided the hydraulic motive power. In Ireland, bog fir was regarded as the best timber for the purpose, due to its centuries of seasoning in the bog.

First Developments

Back in 1759, Smeaton made the first radical improvements to the vertical wheel when he suggested the use of a cast-iron shaft with a hub flanch, to which the wooden arms could be bolted. This arrangement did not come into practical use until 1789, however. The flanch was then developed into a cast-iron hub proper, with sockets in the casting to take the arms fully housed-in—this made a much better wheel structurally. The shrouds and buckets continued to be made of wood, bolted together with iron straps. One of the first high-breast wheels was made by the Catharine Works in Ayrshire in 1825, with cast-iron shrouds in sections, cast hubs, and light cast-iron buckets. General Poncelet had also used castings in his multi-bucket undershot wheel at that period, and this hydraulic machine was widely used on the Continent.

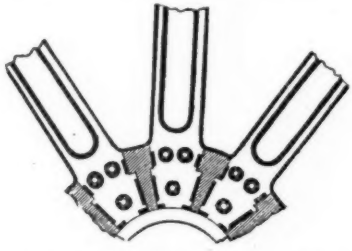


FIG. 1.—*Section of a water wheel which consisted entirely of cast-iron sections, made by John Rowan of Belfast in* 1830.

Cast-iron Water Wheel

In 1830, John Rowan, the Belfast ironfounder, made a water wheel (Fig. 1) entirely of cast-iron sections, including the arms, which were star-sectioned castings (hollow in the inside for two-thirds their length). The bolts alone were of wrought iron. All cast-wheels were considered more durable, as they did not decay or corrode, but they were heavy and required a good working head of water.

G. & J. WEIR, LIMITED, GLASGOW, and Chicago Bridge and Iron Company, USA, are setting up a jointly owned subsidiary company in the US to be known as Weir-Chicago Bridge, Inc. The new company will have as its objective the design, fabrication, and erection of saline-water conversion plants. The company will be utilizing the knowledge and experience of G. & J. Weir in the manufacture of large sea-water evaporation and distillation plants with the fabrication and construction facilities of Chicago Bridge.

Backlog

It is often said that "no news is good news" and similarly that "stale news is no news" and with the latter saying few would disagree. However, with the break in the diary of day-to-day events (normally reported in the JOURNAL*) caused by the recent printing dispute, it is felt that circumstances warrant an attempt to fill the void and that this would be appreciated by readers. Hence, this condensed version of some of the personnel changes, promotions, etc., that have taken place in the intervening weeks, is intended to put readers "in the picture."*

Appointments, nominations, etc.

Recent appointments, nominations or elections to office include the appointment of Sir KENNETH HAGUE, M.I.MECH.E., M.I.E.E., deputy chairman of Babcock & Wilcox, Limited, as a part-time member of the Iron and Steel Board; the appointment of Mr. A. L. LOUDEN to the board of Peglers, Limited, and that of Mr. RONALD ADAMSON as company secretary and comptroller of Joy-Sullivan, Limited, Greenock (Mr. R. A. RUST, whom Mr. ADAMSON succeeds, recently took over the post of general manager of the company's new air power division). The newly-elected president of the Forth Valley Chamber of Commerce is Mr. RICHARD H. ROWAN, a dirctor of Smith & Wellstood, Limited, Bonnybridge. The appointment of Mr. C. M. KRAMSKOY to the board of E.M.I. Electronics, Limited, in the capacity of chief engineer (commercial) carries with it the responsibility of the company's commercial development. At Craven Brothers (Manchester), Limited, Mr. JAMES WEBB has been appointed secretary of the company. Following the acquisition of J. B. Brooks Industries, Limited, by Raleigh Industries, Limited, Mr. H. B. YATES, managing director of J. B. Brooks, has been appointed to the board of the latter concern. Mr. G. KING becomes production control director and Mr. C. A. JACKSON works director of Nottingham factories. The chairman and managing director of Wolf Electric Tools (Limited) is now Mr. GEOFFREY M. WOLFE. Mr. H. RICHARDS who has resigned as chairman remains on the board. Mr. J. L. BLACKWOOD MURRAY has been appointed a director of Leyland Motors, Limited, and Sir HENRY SPURRIER, chairman and managing director of the company, has been re-elected chairman of the British Transport Vehicle Manufacturers Association. Mr. R. H. FOSTER has become a managing director of M. & W. Grazebrook, Limited. Mr. K. SEYMOUR has been elected to the board of Thomas Glover & Company, Limited, a subsidiary of Glover & Main, Limited. On July 1, Dr. K. J. IRVINE relinquished his duties as head of the metallurgy section of the research and development department of the United Steel Companies, Limited, to become deputy research manager. On the same date, Mr. J. D. MURRAY became head of a new section to be known as applied metallurgy, and Mr. F. B. PICKERING became head of another new section on physical metallurgy.

The director of the metallurgical institute of the University of Rome has been elected president of the *Associazione Italiana di Metallurgia* (Italian association of metallurgy). On being appointed a director of English Steel Castings Corporation, Limited, English Steel Spring Corporation, Limited, and the Darlington Forge, Limited, Mr. A. M. SIMMERS relinquished the office of secretary to these companies. His successor in the latter capacity is Mr. P. H. MORWOOD. Mr. J. A. DEWHIRST has been appointed managing director of Midgley & Sutcliffe, Limited, one of the George Cohen 600 Group of companies. Mr. G. V. PALMER, who was elected chairman of the Council of the Institute of Export in June 1958, has been re-elected to the chair. Two part-time members of the Merseyside and North Wales Electricity Board, Sir GEOFFREY SUMMERS, a director of John Summers, Limited, and Mr. CHARLES MORRIS JONES, have been re-appointed to the Board.

Appointments to the board of G. D. Peters & Company, Limited, include those of Lord INVERFORTH, Lord TEVIOT and Mr. H. J. STRETTON as chairman, deputy chairman and managing director respectively. Mr. A. DOWIE has relinquished his appointment as chairman of the company. Mr. W. W. Dolton has been elected president of the British Non-Ferrous Metals Federation in succession to Mr. JOHN GRIMSTON, M.P. Dr. M. COOK, Mr. W. F. SLATER and Mr. MICHAEL CLAPHAM have been re-elected vice-presidents and Mr. C. H. M. HOLDEN has also been elected a vice-president; another re-election is that of Mr. A. L. JOHNSON as treasurer.

This year's president of the Institute of Welding is Mr. E. SEYMOUR SEMPER, managing director of Hancock & Company (Engineers), Limited. He is also this year's president of the British Acetylene Association. Further "welding" news is that Mr. A. A. SMITH, B.SC., A.I.M., head of the welding processes section of the British Welding Research Association, has been temporarily seconded by the Association to the Department of Scientific and Industrial Research for attachment to the staff of the United Kingdom Scientific Mission in Washington, USA. His tour of duty in America will be of about 5 months duration from July 1, during which time he will be visiting manufacturers of welding equipment, fabricators who use the equipment, and some of the centres of scientific research in America which are interested in welding.

The following have been appointed local directors of Marshall Sons & Company, Limited, Gainsborough:—Mr. J. P. BURTON, Mr. G. H. GLOVER, Mr. C. A. HOWE, Mr. T. W. STAINIER and Mr. F. WALKER. The London Midland Region of British Railways announces that Mr. G. B. GRAY, M.A., M.INST.T., who has been acting divisional traffic manager for the East Midlands area since January, has now been appointed to that post, his headquarters being at Clumber Street, Nottingham; Mr. H. A. MUGLISTON has been appointed to a similar post for the Northern Division of British Railways (London Midland Region); his headquarters will be in Barrow. Mr. P. I. MATHER has become secretary of James H. Dennis & Company, Limited, Cornelius Works, Widnes, Lancashire, in succession to Mr. HERBERT HUTCHINSON, who has retired from that office and also from the board. Mr. THOMAS COUGHTRIE, chairman and managing director of the Belmos Company, Limited, Bothwell, has been appointed a director of the North British Locomotive Company, Limited, Glasgow. Mr. C. R. WHEELER, who has been elected a director of Associated Electrical Industries, Limited, is joint managing director of the Guest Keen Iron and Steel Company, Limited, chairman of B.I.S.C. (Ore), Limited, and a director of Guest Keen & Nettlefolds, Limited, the British Iron and Steel Corporation, Limited, and a number of other companies. Mr. JAMES MITCHELL and executives of the company, Mr. W. O. C. ADAMSON, Mr. W. L. CAVE, Mr. W. F. GILBERTSON and Mr. G. L. JONES have been appointed to the board of Richard Thomas & Baldwins, Limited. Mr. ADAMSON had also been appointed general manager of the projected new steel works at Llanwern.

Mr. R. A. WEALLANS, technical manager of Burntisland Shipbuilding Company, Limited, has been elected a director of the company. Newly-appointed directors

of Henry Ford & Son, Limited, Cork, include Mr. T. J. BRENNAN, Mr. W. O'CONNELL and Mr. C. F. J. BROOKE-HARTE. Mr. BRENNAN has been appointed managing director as from September 1, and Mr. J. BUTLER became secretary on August 1. Mr. J. O'NEILL resigned as a director and managing director with effect from August 3, but continues to serve the company in a consultative capacity. Mr. H. O'KANE elected, for personal reasons, to retire from his posts as director and secretary on July 31.

Mr. J. C. AKESTER, managing director of Vent-Axia, Limited, has been appointed a director of the parent company, Hall-Thermotank, Limited, and Mr. J. K. W. MCVICAR and Mr. S. J. JONES have been appointed to the board of J. & E. Hall, Limited, a member of the group. Mr. GEOFFREY W. BONE, a director of Ruston & Hornsby, Limited, has assumed responsibility for the company's engineering policy and for that of its associate, Davey Paxman & Company, Limited. Mr. J. R. BERGNE COUPLAND has been appointed an assistant managing director of Ruston & Hornsby. ING. W. KAJOCH presented on June 18 at the Palace of Staszic, Warsaw, his doctorate thesis entitled: "Problems of High-strength Zinc Alloys Containing Manganese and Copper." Successors to two chairmanships previously held by the late Sir ARCHIBALD J. BOYD are Mr. H. N. EDWARDS (Metropolitan-Cammell Carriage and Wagon Company, Limited), and Mr. PHILIP B. HUNTER (Patent Shaft & Axletree Company, Limited). Mr. D. D. TEASDALE, chief accountant of Fawcett Preston & Company, Metal Industries' engineering subsidiary, took over the additional post of secretary to the company on August 1.

Resignations and Retirements

Amongst those who have resigned from the boards of their companies during the past few weeks are Mr. E. C. RILEY (Vauxhall Motors, Limited); Mr. C. M. SMITH (Peglers, Limited); Mr. A. E. MORRISON (John Shaw & Sons, Limited, Wolverhampton); and Mr. R. S. MITCHELL (E.N.V. Engineering Company, Limited). On reaching retirement age, Mr. ERNEST CROSSE relinquished his position as an executive director of J. Brockhouse & Company, Limited, West Bromwich, at the end of June; Mr. W. G. HENDRY has retired from the board of British Insulated Callender's Cables, Limited. On medical advice, Mr. C. P. JONES has relinquished his posts as director of the Rolls-Royce aero-engine division, and general manager of the company's Derby factories. He has now been appointed industrial relations adviser.

Kodak Scholarships in Advanced Photography

Kodak, Limited, Department 106, Victoria Road, Ruislip, Middlesex, announces that the company is to award a number of scholarships annually to selected students of photography who have already reached a high standard and who wish to devote a further year of full-time work to an advanced course of study. Six awards will be made in 1959 but in subsequent years the number may be increased up to 12. Awards will be based mainly on the merit rating or marks obtained in the following examinations:—(a) City and Guilds of London Institute final examination in photography, and (b) Institute of British Photographers intermediate examination. For the session 1959/1960 the successful students will be enabled to attend a full-time advanced course in photography at The Polytechnic, Regent Street, London. The awards will cover all course fees, the cost of approved text-books and necessary materials, and there will be a living allowance of £400 for the year payable in instalments each term in advance.

Forty Years Ago

June 1919

The month of June 1919 was an important "milestone" in the history of the FOUNDRY TRADE JOURNAL for it was then that it removed from 165, the Strand, London, W.C.2, to Bessemer House, John Adam Street, Adelphi, London, W.C.2, the building which was its home until 1926 when the transfer to Wellington Street, Covent Garden was made. During the second world war, Bessemer House was bombed and on its site more than a decade later, the proprietors built John Adam House, the present home of the JOURNAL.

Editorially, in the June 1919 issue, it was announced that a Refractories Research Association had been formed with Dr. J. W. Mellor, F.R.S., as its director. There also was published an article on the "Use of X-rays applied to the Metallurgy of Steel," by Sir Robert Hadfield who had used this innovation for evaluating the worth of amorphous electrodes. Details are also given in the issue of a take-over bid by a large engineering concern for a slightly smaller concern, but to-day the parties involved are still quite separate companies. Amongst new companies registered appear the names of Metal Castings, Limited, and Robert Kellie & Son, Limited.

July 1919

The July 1919 issue of the JOURNAL reports on the competition British pig-iron makers were having from Alsace Lorraine. At that time there was an excess production of pig-iron due to the destruction of Belgian steelworks and those in Northern France, and inflation had carried the franc to 30 to the pound, so that export was easy. Moreover, the German mark was down to 4d. and reported as likely to depreciate further—which it most certainly did! Probably the first author to deal with the subject of producing grey-iron castings from the electric furnace was Mr. G. K. Elliott, and an abbreviated version of a paper he presented to the American Electrochemical Society in April 1919 was puolished in the issue under review. Mr. Elliott later repeated the lecture in 1921 to the Institute of British Foundrymen at a meeting held in Blackpool, and this was the first of a long series of papers to be exchanged between the two organizations. At that time, a number of trade unions were regrouping as the Amalgamated Society of Engineers. The foundry unions were not interested, but the United Pattern-makers were approached and they eventually declined to join the ASE. Amongst new companies registered the following firms were listed:—General Gas Appliances, Limited; A. G. Spear, Limited; Vulcan Foundry (Walsall), Limited; and James Hogg & Sons (North Shields), Limited.

August 1919

At the Liverpool conference of the British Foundrymen's Association recorded in the August 1919 issue of the JOURNAL, Mr. John Little was elected president. The total membership of the Association was then 1,544 and an influx of about 500 was recorded during the year. Mr. (later Dr.) J. E. Hurst was appointed at the conference to represent the Association on the British Standards Associations Committee on Cast Iron. Later, at a special meeting, the Institute decided to apply for a Royal Charter and to have the name changed to the Institution of British Foundrymen—not Institute as was originally proposed.

Amongst new companies listed in the issue, the following names appeared: Diecastings, Limited; Robert Saunders (Castings), Limited; Dominion Machinery Company, Limited; Wellworthy, Limited (subsequently registered); Henry Gardner & Company, Limited; and Tube Investments, Limited.

Sandwich Courses

The Ministry of Education has published a "List of Sandwich Courses" through Her Majesty's Stationery Office, Kingsway, London, W.C.2, price 3s. 6d. net. In the list, the only foundry courses entering into this category are those offered by the Constantine Technical College, Middlesbrough, and the Bolton Technical College. To enter the courses at the latter College "satisfactory completion of the first two years of a national certificate course or the equivalent standard of full-time education at school" is required, and for the former, it is required that entrants must have the Intermediate City and Guilds diploma, or equivalent, in either patternmaking or foundry work.

For metallurgy a quite imposing list is given in the booklet, detailing sandwich courses in most of the large English cities. Scottish facilities are not included as education on the other side of the border is, of course, autonomous.

IBF National Works Visits Day

Preliminary information discloses that this year's National Works Visits Day, organized by the Institute of British Foundrymen, will be staged in the London area, with the IBF London branch as hosts. This is the day when parties drawn from the Institute's country-wide membership assemble in one area for a series of visits to local foundries—a very successful annual function inaugurated by Mr. R. B. Templeton when he was IBF national president. The date chosen for this year's function is Friday, October 30, and those intending to participate should make early reservation of hotel accommodation as the day comes within the Motor Show period, when London's popular hotels are heavily booked. As is usual at such functions, the day's visits will be followed by reassembly of the parties for dinner together in the evening, when light entertainment will be provided.

Radiation Hazard Investigation

It has been announced in Parliament that a panel of experts is being set up under the aegis of the Radioactive Substances Advisory Committee, with the following terms of reference:

> "To consider, in relation to persons working in research laboratories and research establishments (other than hospital research establishments), the safety and health questions arising from the use of ionizing radiations, and to report."

Professor B. W. Windeyer has agreed to serve as chairman of the panel, and other members of the panel will represent the universities, both sides of industry, Government departments and the nationalized industries. [Free industry is, in the Editor's opinion, too sparsely represented, whilst the committee is overloaded with the Government departments and the nationalized industries. Metropolitan-Vickers Electrical Company, Limited, and Stewarts and Lloyds, Limited, are the only two firms, representing free industry, whose names appear on the list—they are represented by Dr. C. W. Miller, and Mr. W. M. Larke.]

National Foundry College Visits

Students of the National Foundry College made their annual visit recently—to the South of England. The programme commenced on June 15 with a tour of the works of Langley Alloys, Limited, Langley, Bucks, and Anti-Attrition Metal Company, Limited, Maidenhead. On the next day K. & L. Steelfounders, Limited, Letchworth, and British Bath Company, Limited, Greenford, Middx, were visited, and on June 17, Le Grand Western Foundries, Limited, Southall, and Broom & Wade, Limited, High Wycombe. June 18 was taken up by visits to Ford Motor Company, Limited, Dagenham, and Lake & Elliot, Limited, Braintree, Essex, and the series concluded on June 19 with tours of Kent Alloys, Limited, Rochester, and A.P.V. Company, Limited, Crawley, Sussex.

Bradley & Foster Golf Winners

Prizewinners at the Bradley & Foster, Limited, golf competition (see JOURNAL, *page* 684 *of June* 11 *issue) —(left) Mr. H. W. Bonser receiving the McKenna Cup from Mr. Harmar Nicholls,* J.P., M.P.; *(right) Mr. L. Bramhall (second in the competition), Mr. Bonser (carrying the Cup) and Mr. R. J. Sherwood (third), with Mr. Harmar Nicholls and Mr. M. Froggatt (deputy managing director of Staveley Coal & Iron Company, Limited, with which firm Bradley & Foster are associated).*

W. H. Thursfield Presentation

In recognition of his 23 years' association with the National and Midland Iron Founders' Association, Mr. W. H. Thursfield (who was a member of the committee of inception way back in 1936) was on June 4 presented with a silver tea-service and cigarette box at an informal presentation which followed a luncheon at the Station Hotel, Dudley. Mr. Thursfield, a director of Izons & Company, Limited, West Bromwich, of Albion Foundry, Limited, Tipton, and also of Waterford Iron Founders, Eire, was elected vice-chairman of the National and Midland Iron Founders' Association in 1947, and ten years later became chairman, which post he held until he retired this year. The illustration shows Mr. Thursfield (left) receiving the presentation from the present chairman of the Association, Mr. W. James (managing director of Monmer Foundry, Limited, Willenhall), with Mr. E. C. Marsland (centre).

European Mechanical Handling Federation

The 13th meeting in Paris of section IV (industrial trucks) of the *Federation Européenne de la Manutention* (European Mechanical Handling Federation) was attended by 50 delegates from 10 European countries, Great Britain being represented by six delegates; a representative of the USA truck industry was also present as an observer. Work on standardization of controls for industrial trucks which had been mainly initiated by the French group progressed to a point at which final agreement on many aspects is within sight. The British group presented a first draft of a proposed "Safety Code for Industrial Trucks" and after discussion it was agreed that a Code should be produced in two parts. The first being a manuafcturers' code of practice couched in technical terms for the use of members of the Federation, the second part being a safety code for circulation among users, to be based on the manufacturers' code of practice but in simplified form, comprising nomenclature, stability factors, brake performance, etc. This will be followed by a section devoted to operating techniques, with a final section which would give standard practices for maintaining industrial trucks. The British group have undertaken to provide further material for discussion at the September meeting on section IV.

Institute of Vitreous Enamellers

Silver Jubilee Conference Exhibition

This year the Institute of Vitreous Enamellers celebrates its 25th anniversary and to mark the occasion a Silver Jubilee Conference and Exhibition is to be held at the Park Lane Hotel, Piccadilly, London, W.1, from September 14 to 19. Details of the programme are as follow:—

Monday, September 14.—Registration will commence in the afternoon, and in the evening there will be a reception, and the official opening of the conference and exhibition.

Tuesday, September 15.—Delegates will take part in one of the following works visits (*a*) Lafarge Aluminous Cement Company, Limited; or (*b*) R. & A. Main, Limited, and Belling & Company, Limited; or (*c*) R. & A. Main, Limited, and Benjamin Electric, Limited. For the ladies a tour of London has been arranged.

Wednesday, September 16.—Delegates will have a choice of two works visits—(*a*) British Bath Company, Limited, and Aladdin Industries, Limited, or (*b*) General Electric Company, Limited, and Frigidaire. Informal dinner/dance in the evening.

Thursday, September 17.—In the morning, following the annual general meeting, Professor A. I. Andrews will present the Mellor Memorial Lecture. Papers to be presented at the technical session in the afternoon include "Fundamentals of Gas Evolution from Vitreous Enamelling," by Mr. G. P. K. Chu; "Blistering of Wet Process Vitreous Enamels on Cast Iron—Some Facts and Theories," by Mr. E. R. Evans and Mr. A. D. Morgan; and "Pinholes and Porosity in Castings for Vitreous Enamelling," by Mr. C. A. Sanders. An excursion to Windsor and the Thames Valley has been arranged for the ladies.

Friday, September 18.—The morning session will comprise three papers (1) "Control of Furnace Temperatures," by Mr. W. J. Swinn; (2) Correct Use of Fuel-oil and Burning Equipment," by Mr. G. O. Fenner and (3) "Refractories," by Mr. D. Dixon. In the afternoon the papers will be "Modern Methods of Decoration," by Dr. W. L. German; "Critical Assessment of Vitreous Enamel for Domestic Purposes," by Miss Whalley, and "Effects of Detergents," a subcommittee report. Ladies will attend a floral arrangement demonstration. The annual banquet takes place in the evening.

Saturday, September 19.—The final technical session, when Mr. F. Rickman will present a paper and film on "Interface Phenomena in Enamels."

The conference fees are £14 for members and £13 for ladies, and those intending to participate should make application as soon as possible to Mr. John D. Gardom, secretary of the Institute of Vitreous Enamellers, Ripley, near Derby.

Stal

The Iron and Steel Institute (4, Grosvenor Gardens, London, S.W.1) are translating into English the whole contents of the Russian magazine *Stal* (Steel) and publishing this version monthly. The first issue was made available in June, the contents of which at least are interesting and comprehensive, covering as they do ironmaking, steelmaking, electric-furnace practice, rolling and tube production and heat-treatment. The magazine costs £20 12s. a year; a price reduced to £15 12s. to members of the Institute (post free in both cases). Single copies are £12 1s. and £1 11s. in the cases indicated.

Notes from the Branches

Northampton Section

At the annual general meeting of the Northampton and district section of the Institute of British Foundrymen held in April at the Plough Hotel, Northampton, Mr. H. Edge was elected president for the ensuing year, Mr. R. Jelley, senior vice-president, and Mr. A. Tipper, junior vice-president. Mr. W. D. Ford was re-elected secretary and the new members elected to the Council were Mr. Hope, Mr. Hodgkiss and Mr. Mason. It was reported that the attendance at meetings continues to grow and that the number of new members who had joined during the last year had increased three fold. This particular point was later brought out by Mr. W. J. Wood, who voiced the opinion of the members present in congratulating Mr. J. T. Stevens, the retiring president, on obtaining so many new members during his year of office.

Following the business of the meeting Mr. H. Pinchin, manager of the Stanton Ironworks Company's Erewash Foundry, presented a paper entitled "Some Practical Experiences in making Moulds in a Mechanized Foundry."

The Stanton foundry produces large castings such as tunnel segments, siphon boxes, manhole covers and frames and a great variety of large pipe specials in considerable quantities. Sandslingers are used throughout to ram 100 tons of sand per hour and the system of moulding instituted by Mr. Pinchin enabled an easy changeover of jobs and new ones to be introduced on a standard system of box construction, ramming speeds and coremaking.

The author explained the importance of close attention to cup and liner clearances in the slinger head to maintain ramming density, and said that where a more permeable mould was required the best practice was to change the slinger head to one of smaller diameter instead of setting back the cup. He also emphasized the importance of shaping boxes and bars so as to provide as near as practicable a uniform gap between the pattern and box in which to ram. The path the slinger head should follow when ramming the mould was shown on a number of excellent slides, and a film of the sand stream leaving the slinger head, using three different cup to liner clearances, was most revealing.

In the foundry, Mr. Pinchin said, nearly all the cores were made from green-sand, and in the case of pipe specials and castings which have to be pressure tested, the use of chaplets was avoided by using very strong core irons carried through to the outside of the box parts for support and for wedging to prevent the cores from turning during casting. These cores were also made on slingers by ramming into the bottom half of the corebox, with a light frame taking the place of the top-half corebox and shaped so as to give 2 per cent. excess sand in the core. With this top frame removed and the core carried in the bottom half, it was put under a press which carried the top half. It was only at this point that the two halves of the corebox met to squeeze the oversize core to its correct shape and diameter. The use of a naturally-bonded sand Mr. Pinchin said made it of paramount importance to keep the permeability at AFA No. 100 and to do this it was necessary to pass all knockout sand through two coolers and desilters. A small amount of coarse sand (one per cent.) was added in bulk, and as any oil-sand cores which were used went into the moulding-sand system, this core-sand was kept as coarse as casting finish permitted.

The photograph below shows the party of members of the Wales & Monmouth branch of the Institute of British Foundrymen who recently visited the works of Dialoy, Limited, Cardiff. Departments visited included die-designing and manufacture; die- and sand-casting; shell-core production and the finishing shops. At the conclusion of the tour a vote of thanks was proposed by Mr. A. S. Wall, branch secretary, and seconded by Mr. Gordon Jones; Mr. L. G. Duddridge, works director of Dialoy, responded.

Equipment and Supplies

Investril-Plycast Process

In the Investril-Plycast process (inquiries to Investril Casting & Metallurgical Services, Limited, 164, Walsall Road, Four Oaks, Sutton Coldfield), a shell is produced over a wax pattern by a dipping technique. Similar processes are already familiar in the investment casting industry but it is claimed that Investril-Plycast differs from them in that costs are much lower, there is a more rapid cycle of production, and the making of the moulds can be done mechanically by the FC range of mould-making machines.

The mould is built up of refractory material to a thickness of between $\frac{1}{4}$ to $\frac{1}{2}$ in. When ready to be used it is highly porous, requires no external support during casting, and is claimed to withstand ferrostatic pressures very well. Castings up to 33 lb. in weight have been cast into unsupported moulds. An approximate material cost for the average mould is about 6d., and by simple manual methods it can be made in about 15 min. In mechanized installations this time can be reduced considerably by carrying the pattern, ready for dipping, to a mould ready for dewaxing.

After dewaxing, shells may be stored indefinitely. Preheating prior to casting may be rapid, and can be completed in 70 min. A major advantage is rapid and uniform dissipation of heat, and close packing of the patterns is not essential. The method is claimed to be suitable for a wide variety of steels, as well as other types of materials. By nature of the mould tolerance, variations from casting to casting are small, and reject rates low.

Lectromelt and Demag tie-up with G.W.B.

G.W.B. Furnaces, Limited, Dibdale Works, Dudley, Worcs, announce that they have concluded agreements for the co-operative manufacture and sale, in Great Britain and most of the Commonwealth countries, of the whole range of melting plant designed by Demag-Elektrometallurgie GmbH, of Duisburg, Germany, and Lectromelt Furnace Division, McGraw-Edison Company of Pittsburgh, USA. The total installed capacity of Demag and Lectromelt arc-melting furnaces represents 6,750,000 kva, corresponding to 2,800 installations. This agreement enables G.W.B. to offer arc furnaces with a capacity of up to 200 tons, with or without rotating shell and alternative electrode control systems, these being static- or rotating-magnetic-amplifier type or hydraulic.

In addition, the agreement with Demag covers submerged-arc furnaces for the reduction of ores and production of ferro-alloys and calcium carbide. In this type of equipment total connected loads exceed 850,000 kva. The field of induction-melting furnaces is also well covered, enabling G.W.B. to offer Demag-designed crucible-type units for mains-frequency or motor-alternator operation for steels, irons and non-ferrous metals. Channel-type mains-frequency induction-furnaces may also be supplied for melting light metals, copper and copper alloys, zinc and irons.

Thermocouple Wire

A miniature thermocouple-wire, with an outside diameter of only 0.5 mm., is the latest addition to the Thermocoax range of ceramic-packed thermocouple-wires, distributed in the UK by Research and Control Instruments, Limited, Instrument House, 207, King's Cross Road, London, W.C.1. Known as the Thermocoax 2AB Ac 05, the wire has an outer sheath of 18/8 steel, and cores of Chromel/Alumel (trade mark of Hoskins Manufacturing Company) insulated from each other and the sheath by powdered magnesium-oxide.

Temperature range is stated to be 0 to 900 deg. C., and an accuracy of 2.8 deg. C. up to 350 deg. C., and of 0.75 per cent. from 350 to 1,000 deg. C. is claimed together with good stability, short response time, high mechanical strength, and good electrical insulation. The wire may be bent on a radius of 1 mm. A new 1-mm. Thermocoax, with Inconel sheathing, is also available, with greater resistance to corrosion than the standard 18/8 steel-sheath type. Another innovation is a box of accessories for facilitating the correct forming of thermocouples, and for protecting the couple itself against corrosion.

Electronic Controls

A mobile exhibition unit from Lancashire Dynamo Electronic Products, Limited, of Rugeley, Staffs, recently visited London, and was sited in the forecourt of the Festival Hall. Amongst equipment displayed of interest to foundrymen was a smoke densometer (Smoke Alarm Series SME. 2) which ensured compliance with the Clean Air Act. This warning device consisted essentially of a regulated light source, on one side of a smoke stack, which was directed at a photocell on the other. It is claimed that this is the only unit at present bearing the British Standards Institution's "Kite" mark.

Another interesting device exhibited was one which could be set to automatically control the lighting system of a large factory, switching on in the morning and off at night from Monday to Friday, or during the whole week if required. Also demonstrated were a range of the usual photo-electric switches, operating by interruption or partial obscuration of a light source.

BAKELITE, LIMITED, 12-18, Grosvenor Gardens, London, S.W.1, have introduced three hardeners—DQ.19121, DQ.19127 and DQ.19128—which are designed for use with standard Bakelite liquid epoxide resin R.18774/1. It is claimed that these hardeners, which are anhydrides, give long working life and low viscosity suitable for use in casting, potting, laminating and impregnating applications. At elevated temperatures, the systems harden with little shrinkage and low exotherm to give products with good mechanical and electrical properties.

FOUNDRY SUPPLIERS, LIMITED, 25a, Cockspur Street, London, S.W.1, announce that they have been appointed the sole agent within the foundry industry in England and Wales for a fuel-oil improver and sulphur inhibitor known as Desulfurol. The use of this material, it is claimed, can bring about substantial reduction in sulphur contamination of molten metal, where this is in direct contact with the flame from sulphur-bearing fuels; also it eliminates the menace of sulphur fumes.

WALKER, CROSWELLER & COMPANY, LIMITED, Cheltenham, have extended their range of Arkon variable-flow indicators. These instruments may be adjusted for high or low velocities of flow, and now include sizes 1¼, 1½ and 2 in., in addition to the previous sizes of up to 1 in.

A TRIAL OFFER of the full range of Surform hand-tools is being made by the manufacturers, Simmonds Aerocessories, Limited, Treforest, Glamorgan (a member of the Firth Cleveland group). The scheme applies to all Surform tools and will be in operation until the end of this month.

American Letter

Evaluation of Cast Mg/Th/Zr Alloy HK31A*

This article is based on testing and evaluation of castings made from the magnesium alloy designated HK31A (chemical composition: Th 2.5 to 4 per cent., Zr 0.5 to 1.0 per cent., Mg remainder). Thorium, with an atomic weight of 232 and a density of 11.5, is more opaque to X-rays than magnesium (atomic weight 24, density of 1.74). Zirconium (atomic weight 91, density 6.5) is also more opaque than magnesium—the absorption coefficient of X-rays increases with the atomic number of the absorbing atoms, the number of atoms per unit volume, and the X-ray wavelength. As a result, portions of a casting that contain a higher than normal concentration of thorium or zirconium will absorb greater amounts of radiation, and will appear as light areas on X-ray films. These areas are excellent evidence of macrosegregation in the castings. An evaluation of the effect of this segregation on the mechanical properties of the cast material was made.

Test Method

Several castings were selected, on the basis of X-ray indications, to be cut into tensile specimens representative of the segregation conditions. These specimens were tensile-tested at room temperature, and at 260 deg. C. Autoradiographs, radiographs, micrographs and spectrographs were made of the specimens to investigate variations in composition and associated effects. It was affirmed that the X-ray indications were caused by segregation, and that the segregation had a definite effect on the microstructure. It was possible, using radiographic, spectrographic and metallographic examination, to determine with fair certainty that a compositional variation is responsible for the effects observed.

Deficiency Condition

An examination of the data indicated that the deficiency condition did not affect the room-temperature mechanical properties of the material. Testing at 260 deg. C., however, showed that the deficiency condition definitely promoted failure. The data showed that this condition reduced average ultimate tensile strength by about 8 per cent., and per cent. elongation by about 24 per cent. This reduction is to be expected, considering that thorium is added to impart high-temperature strength. The coarse grain-size observed in association with deficient regions is believed to be significant in contributing to the loss of ductility and ultimate strength.

Heavy Segregation

Room-temperature testing of specimens with heavy segregation showed an average loss in ultimate tensile strength of 15 per cent., and a loss in per cent. elongation of 37 per cent. The average 260 deg. C. ultimate tensile strength, and per cent. elongation, values were found to be 7, and 58 per cent. respectively lower than observed in the normal samples. Regions deficient in alloying elements had reduced elevated-temperature mechanical properties, but had normal room-temperature properties.

Additional Inspection Requirement

Certain critically stressed regions of the castings are required to have the following room-temperature mechanical properties: 12.04 tons per sq. in. minimum ultimate tensile strength, 5.80 tons per sq. in. minimum yield strength at 0.2 per cent. offset, and 4 per cent. minimum elongation. These regions are also required to have properties of 8.47 tons per sq. in. minimum ultimate tensile strength, and 4.77 tons per sq. in. minimum yield strength, when tested at 260 deg. C. In order to be relatively certain that these castings would perform to expectation, it was deemed necessary to add an additional inspection requirement to the already thorough inspection procedure. This requirement is that critically stressed regions must not exhibit segregation or deficiency in excess of that illustrated in three X-ray standard film blocks. Although these standards do not cover all eventualities, they will be used until replaced or supplemented.

Improvements Needed

The extensive use of castings for missile structure application will depend on the foundry industry progressing to where it can offer the missile designer the following advantages:

(1) Guaranteed strength and ductility *in the casting.* (Separately-cast test-bar values will not be acceptable.)

(2) Maximum consistency and reliability throughout any batch of castings and accurate chemical composition analyses.

(3) Castings designed on the basis of the ultimate in wrought properties.

(4) Increased dimensional accuracy, permitting the maximum use of as-cast surfaces.

(5) Specifically-formulated casting alloys to compete with the wrought superalloys.

One-week Course on S.-g. Iron

A one-week course on s.-g. iron technology was held from June 29 to July 3 at New York University. It consisted of 25 lectures and discussions on the latest developments in the field. Informal evening discussions were also held. D. J. Reese (director, ductile-iron division, International Nickel Company) delivered the opening address. Prominent among the speakers were three internationally known European experts: H. Morrogh (British Cast Iron Research Association), W. W. Braidwood (Mond Nickel Company, Birmingham, England) and Dr. E. Mortara (Caster, Bologna, Italy).

A list of speakers and their subjects is given below.

Rointan F. Bunshah (NYU) "Iron-Carbon Diagram and Steels"; John P. Nielsen (NYU) "Cast Irons and Malleable Irons"; K. D. Millis (International Nickel Company) "Metallurgy of Magnesium-containing Iron"; H. Morrogh (British Cast Iron Research Association) "Theoretical Considerations of Spheroidal Graphite Formation"; R. A. Flinn (University of Michigan) "Engineering Properties of Ductile Iron"; C. R. Isleib (Inco) "Mechanical Properties of Ductile Iron"; J. L. Salbaing (Inco) "Machinability and Welding Characteristics."

Howard F. Taylor (Massachusetts Institute of Technology) "Effect of Alloying on Properties and Matrix Structures"; Charles C. Reynolds (Dartmouth College) "Effect of Heat Treatment on Properties and Structure"; W. W. Braidwood (Mond Nickel Company) "Melting Methods and Procedures"; R. W. White (Inco) "Methods of Magnesium Treatment and Inoculation"; a representative (Morris Bean & Company) "Precision Moulding of Ductile Iron"; A. A. Adams (Ford Motor Company) "Quality Control and Testing" Harry W. McQuaid, consultant, "Hot Working of Ductile Iron"; J. L. Salbaing (Inco) "Designing for Ductile Iron."

H. W. Northrup (Inco) "Specifications and Codes"; W. D. McMillan (International Harvester Company) "Applications in Farm Equipment"; K. H. Kurgin (Inco) "Applications in Fluid Handling Equipment"; Garrett D. Orr (Hodge Foundry Company) "Applications in Steel Mill Maintenance"; W. H. Dawson (Inco) "Applications in the Automotive Industry"; E. Mortara, Bologna, Italy, "Applications in Europe, Africa, and the Far East," and F. G. Sefing (Inco) "Properties and Applications of Ductile Ni-Resist."

* From work done by T. R. Bergstrom and R. G. Bassett, who are associate research engineer, and research engineer, respectively in the materials unit, pilotless aircraft division, Boeing Airplane Company, Seattle, Washington.

BCIRA Open Day

More than 250 visitors, including many foundrymen, were present on May 28 at the first Open Day of the British Cast Iron Research Association, at Bordesley Hall, Alvechurch, Birmingham. In the picture below the president, Mr. E. Player, C.B.E. (deputy chairman and managing director of Birmid Industries, Limited) is shown inaugurating the new experimental cupola installation, which was described in detail in the May 28 issue of the JOURNAL.

The second illustration (above) shows Dr. J. G. Pearce, C.B.E. (a former director of the BCIRA), formally declaring open the new foundry-atmospheres laboratory, which has been established at a cost of £25,000. Mr. G. R. Woodward (manager, BCIRA Intelligence Department) at the opening ceremony, stressed the urgency of better fume and dust control, in order to meet the requirements of the Clean Air Act. In this picture Dr. Pearce is accompanied by Mr. H. Morrogh, the present director.

New Sales Policy

Solid-fuel-fired domestic heating and cooking apparatus is not the easiest equipment to sell, and with this in mind, Allied Ironfounders, of 28, Brook Street, London, W.1, have launched two special experiments—which they hope may revolutionize the selling and buying of these commodities—in association with builders' merchants. The new types of service, foreshadowed by these experiments, include expert advice, in the customer's own home, before he chooses; a single, comprehensive hire-purchase agreement through which all the equipment and all builder's charges and installation costs can be covered by a single monthly payment; and after-sales service. It is a policy which is much to be commended.

French Business Information

The Board of Trade from their Export Services Branch, Lacon House, Theobalds Road, London, W.C.1, have issued two excellent reports—"Representation in France" (reference GEN/5010) and "Forming a Company in France" (reference GEN/5011). They contain extremely valuable information, although it is not every day that a firm has either of these needs. In both cases it seems that the advice of a Parisian legal house is a prerequisite and a list of British qualified practitioners is given. It should be borne in mind that in matters of this kind the Board of Trade is always ready to give assistance.

All enquiries for such assistance should be sent to the Board of Trade at the address quoted above.

Company Meeting

The Wolverhampton Metal Company

STRONG FINANCIAL POSITION

Mr. Thomas C. James on Efforts to Increase Efficiency

The 56th annual general meeting of The Wolverhampton Metal Company, Limited, was held on July 28 in Birmingham, Mr. James H. Furnival (Vice-Chairman and Joint Managing Director) presiding in the unavoidable absence through indisposition of Mr. Thomas C. James (Chairman and Joint Managing Director).

The following is an extract from the Chairman's circulated statement:—

The severe conditions referred to in my last report have continued and intensified. In these circumstances I think that you will agree that the results for the year ended March 31, 1959, are satisfactory. Group Profits at £470,215 before taxation compare with £507,119 in the previous year.

In spite of the shortage of raw materials, we increased production at Wednesfield (Ingot Metals) and James Bridge (Cathode Copper, etc.), but factors affecting our margins adversely were:—Excess of productive capacity in the industry over the demand for the products, particularly in relation to alloys, resulting in serious price competition; keen competition for the available raw materials and the fall in the level of export prices affecting all producers of ingot metal; business, which had been reasonably profitable in some cases, became uneconomic. To meet this situation we have been striving, by improving our processing techniques, to reduce costs of production.

Full advantage has been taken of the latest technical developments in the industry including improved laboratory methods. To cope with the much stricter specifications now being developed by the British Standards Committee, we have re-equipped our Laboratories with the latest instruments, enabling us to deal with the increased demand for analysis and control and easing the burden on the members of our laboratory staff.

The Accounts

I referred in my Statement last year to our Capital Expenditure programme, designed to increase efficiency of production and widen the scope of our activities. During the year under review £112,535 was spent under this heading. Current Assets at £2,027,392 exceed Current Liabilities at £613,921 by £1,413,471.

After providing £80,784 for depreciation our Group Profit is £470,215. Taxation assessable thereon is £215,915. A result of the reduction in the level of taxation is that our distribution profit exceeds that of last year by £15,159, although the trading profit before taxation is less than in the preceding year by £36,904.

The Board has given careful consideration to the question of dividend. The available profit is some £15,000 higher and the Group has substantial reserves and ample cash resources. At the same time the prospects for the current year are that at present, an increase in profits cannot be anticipated. In these circumstances the Board has decided to recommend that the final dividend be maintained at 17½ per cent., less Income Tax, making a total of 27½ per cent. less Income Tax for the year. In view of our strong position, however, it has been decided to recommend in addition a special bonus of 5 per cent., less Income Tax.

Future Outlook

Current trading conditions indicate that for the time being we shall have to continue to face highly competitive conditions similar to those of the year just ended. In spite of the uncertainty of the metal market and the reluctance of buyers to place orders for forward sales, our order-book continues to be satisfactory.

To maintain our position in the forefront of the industry considerable further capital expenditure will be necessary for buildings, plant, machinery, and equipment. Our technical strength and financial resources will enable us to meet the present-day conditions and we shall be well equipped to take advantage of any improvement in trade which may eventually arise.

The report and accounts were adopted.

Latest Foundry Statistics

Steel Castings: Employment in the steelfoundries suffered a slight reduction during the period March 7 to April 4. The British Iron and Steel Federation and the Iron and Steel Board in their joint *Bulletin* for May report that when a count was taken on April 4, 17,430 were employed, or 110 fewer than on March 7. The provisional figures for the average weekly output of steel castings during April was 5,000 tons, which is much better than the low figure of 4,700 tons returned, again provisionally, for March.

Copper-base Alloys: An improvement in the production of copper-base castings was reported by the British Bureau of Non-Ferrous Metal Statistics for the first four months of the year, when output was 25,152 tons as against 25,246 tons for the corresponding period in 1958. Production in April was 7,205 tons, a distinct improvement over the monthly average. However, for May the Bureau reports that output of these castings was only 5,818 tons—a fairly low average.

Light Alloys: Very belatedly (July 7) the Ministry of Supply published the production figures for the light alloys for the month of March. From them it is learnt that 1,445 tons of aluminium castings were made from sand moulds; 3,801 tons of gravity-die castings and 1,593 tons of pressure-die castings were produced. The output of magnesium-alloy castings was 145 tons. Production of these castings in April was 1,636 tons; 4,214 tons and 1,831 tons respectively, whilst output of magnesium castings was 163 tons.

Ironfounding: The Council of Ironfoundry Associations states that of the 123,446 workers employed in ironfounding during the week ending May 30, 114,963 were males and 8,483 females. The increase over the May 2 figures was four, made up of a decrease of three men and a gain of seven women.

FOR SEVERAL WEEKS PAST, one of the principal display windows at the New South Wales Government's offices in the Strand, London, has been devoted to publicising a foundry supply firm. Presumably as an indication of the growing industrial potential of the area, the exhibit is set out to draw attention to the establishment by Foundry Services Australia Pty., Limited, of substantial manufacturing premises at Padstow, New South Wales.

News in Brief

W. RICHARDS & SONS, LIMITED, has plans to enlarge the works at Britannia Foundry, North Ormesby Road, Middlesbrough, Yorks. Adjoining premises have been acquired for this purpose.

CLEVELAND TECHNICAL COLLEGE will be opened on September 4, by Sir Alexander Fleck, chairman of Imperial Chemical Industries, Limited, according to a statement issued by the North Riding Education Committee.

Mr. W. P. MULLEN, general manager, Chamberlain Plant, Limited, manufacturers of cranes, excavators, etc., Crown Works, Enfield, Middlesex, who has been on a business trip to European and Mediterranean countries, recently returned to the UK.

THE MINISTRY OF SUPPLY has placed an order for Centurion-tank gearboxes, worth £110,000, with David Brown Industries, Limited. The units will be manufactured by the David Brown automobile-gear and gearbox divisions at Park Works, Huddersfield.

CHAMBERS BROS., LIMITED, ganister manufacturers, Stoke Street, Sheffield, have received an order for 400 tons of ladle-lining refractories material for a steelworks in the north of Sweden, in the Arctic circle. The first shipment went by barge to Goole in June.

NEWTON, CHAMBERS & COMPANY, LIMITED, of Thorncliffe, near Sheffield, have developed a fully-automatic oil-fired boiler (Centramatic 80), which incorporates a new type of burner. This burner is a fan-pressurized unit incorporating electric ignition and a co-axial type fan.

AN ENGINEERING MATERIALS AND DESIGN exhibition and conference is to be held next year, from February 22 to 26, at Earls Court, London. Engineering materials to-day include minerals, plastics, textiles, rubber, refractories, ceramics, etc., and at the exhibition, the first of its kind in this country, a most varied selection of these and other materials will be displayed.

FEDERATED FOUNDRIES, LIMITED, have placed an order with Baker Perkins, Limited, of Bedewell Works, Hebburn-on-Tyne, for the supply of a Taccone diaphragm moulding machine. The machine, which will cost £27,000, will be capable of squeezing simultaneously two moulding boxes 84 by 36 by 12-in. deep. The squeeze time for one complete mould will be 1.5 seconds. It is believed that the machine will be one of the largest sand-moulding machines in the world.

DR. W. A. MACFARLANE, managing director of the National Industrial Fuel Efficiency Service, addressing a meeting of Sheffield industrialists, said that industry had now entered a period when cost, productivity and quality of output were far more important than in the days of a sellers' market. For this reason the NIFES had had 20 per cent. more calls for advice last year. In five years of its existence more than half of the country's major consumers—3,500 out of 6,900—had called on its services.

THE SUCCESS OF A NEW INDUSTRY which it helped to establish in the Philippines last year has netted a three-quarter million dollar repeat order for a Rochdale engineering and consultant firm. The order has been placed with Thomas Robinson and Son, Limited, by Republic Flour Mills Incorporated, the Manila Company for which Robinson's established the first flour mill in the Philippines. It calls for the setting up of a further mill to increase the output of flour from 17,250 lb. per hour to over 31,000 lb. per hour. A major factor in the placing of the contract was the wide field of service which the Rochdale company was able to offer.

LORD NORTHESK, recently, unveiled at the works of the British Rolling Mills, Limited, Tipton, a plaque commemorating the fact that the factory stands on the site of the historic Bloomfield Ironworks where the first commercial beam engine, designed by James Watt, was installed in 1776. Mr. J. Francis Parker, a director of British Rolling Mills, discovered that the historic link existed when he read a biography of James Watt. After consulting the Newcomen Society he decided on the erection of an appropriate memorial. Mr. Parker's father—another Mr. J. F. Parker—presided at the unveiling ceremony. Mr. Parker, senior, is a Fellow of the Society of Antiquaries.

TO ASSIST in the training of technicians, Evershed & Vignoles, Limited, Acton Lane Works, Chiswick, London, W.4, have made available certain of their industrial instruments in specially adapted form to enable the operational functions and details of construction and maintenance to be studied. The instrument mechanisms are exactly similar to those supplied for industrial applications—but the provision of transparent windows and other facilities make the units ideally suited for training purposes. The three main types available are a model Servo Mechanism; a process controller and simulator, and Megger testing sets for insulation, continuity and earth-testing procedures.

TO COMMEMORATE ITS 150TH ANNIVERSARY, on June 1, employees of the Smethwick firm of Evered & Company, Limited, were granted a bonus based on years of service up to a maximum of £25, and pensioners were given a 15 per cent. increase in their pensions. On May 28, the Mayor and Corporation of Smethwick were entertained at the factory and an exhibition of the company's products was staged for the visitors. In July, employees' families made a tour of the works where the firm has been in production for 93 years. The company was founded in Drury Lane, London, by Richard Evered. Mr. Ernest Miller, a 79-year-old director of the company, came from Australia to attend the commemorations.

THE COLLEGE OF ADVANCED TECHNOLOGY, Birmingham, is again offering a full-time course of three weeks' duration on "Statistical Quality Control and Acceptance Sampling," commencing Monday, August 31. Although primarily intended as an introduction to the subject, the course will provide the basic training necessary for quality control engineers. The first fortnight will be spent in covering the general principles and procedures of quality control. The final week will be devoted to lectures by specialists from industry, and to visiting the works of firms employing quality control. Further details and application forms can be obtained from the Registrar, College of Advanced Technology, Gosta Green, Birmingham, 4.

THE NEW NO. 4 BLAST FURNACE at the Port Kembla Steel Works, N.S.W., of Australian Iron & Steel, Limited, major subsidiary of the Broken Hill Proprietary Company, Limited, was blown-in on Thursday, May 28. The furnace, designed, manufactured and erected by the Ashmore, Benson, Pease & Company, Limited (of the Power-Gas Group), Stockton-on-Tees, has a hearth diameter of 29 ft., and is reported to be the largest blast furnace in the southern hemisphere with a nominal capacity of 1,700 tons of pig-iron per day. The contract for Ashmore, Benson, Pease & Company, Limited, valued at about £3 million, included the supply of the blast furnace and auxiliary equipment including scale cars, an orebridge with 270-ft. span and 18-ton capacity grab, and two ore unloaders with 15-ton capacity grabs. The furnace itself stands 273-ft. high.

Personal

Mrs. M. E. CARTER has been appointed to the board of Ada (Halifax), Limited.

Mr. P. WRIGHT has been appointed a director of Buckley & Taylor, Limited.

Mr. W. T. GARDINER has been elected a director of Smith & Wellstood, Limited.

Mr. JOHN V. SHEFFIELD has been elected a director of Mechans, Limited, Glasgow.

Mr. A. CHAMBERLAIN has been appointed a director of J. Brockhouse & Company, Limited.

Colonel P. H. JONES has been appointed a director of the Halesowen Steel Company, Limited.

Mr. W. CUSWORTH has been appointed a director of the Brightside Foundry and Engineering Company, Limited.

Mr. JOHN P. LE GRAND, a director of Le Grand, Sutcliff & Gell, Limited, a member of the Stone-Platt Industries group, has retired.

Mr. PETER MIDDLEMAS, a director of the Birmingham Railway Carriage & Wagon Company, Limited, has been elected senior vice-president of the Birmingham Chamber of Commerce.

Sheepbridge Stokes, Limited, announce the appointment of Mr. MICHAEL E. SOUTHWAY, of 89, Bishop Street, Bristol, 2, as technical representative in the South-West England and South Wales areas.

Mr. J. W. GARDOM is visiting Israel for a short time in connection with the installation of a steel foundry at Tel Aviv. He will also make calls on the various Ministeries at Tel Aviv, Jerusalem and Haifa.

Mr. W. T. HALE, sales director of Thos. Marshall & Company (Loxley), Limited, is visiting the Argentine, Brazil, Chile and Uruguay as part of his firm's efforts to increase its business with the Latin American market.

Mr. JOHN DEARDEN, assistant superintendent (metallurgy division) British Railways Research Department, Derby, has been appointed superintendent of the division in place of Mr. T. HENRY TURNER, who has retired.

Mr. ARTHUR G. JONES, former director and general manager of Broom & Wade, Limited, has been appointed managing director of Guy Motors, Limited, from July 1. He succeeds Colonel A. JERRETT who has retired for health reasons.

Mr. HENRY ALLEN, industrial relations manager of the Yale & Towne Manufacturing Company, British Divisions, has been elected chairman of the Wolverhampton and Black Country branch of the Institute of Personnel Management for the coming year.

New appointments for Bowmaker (Plant), Limited, include Mr. W. J. LLOYD as South Wales area manager; Mr. DENNIS M. BEDDOWS as sales promotion manager; Mr. F. J. BUTLER as used-equipment manager, and Mr. JACK COOPER as representative in the south west area.

Mr. H. R. SMITH has been appointed executive vice-president of the aeronautical division of A. V. Roe Canada, Limited. He succeeds Mr. F. T. SMYE who has resigned. Mr. J. L. PLANT, president of Avro Aircraft, one of A. V. Roe Canada's subsidiary companies, has also resigned.

Mr. H. HUMPHRIES, managing director of Hadfields, Limited, has been appointed chairman of Millspaugh, Limited, a subsidiary company, in succession to Lord DUDLEY GORDON, who has resigned from the board. Lord Dudley Gordon remains chairman of Hadfields. Mr. R. C. HEYS, managing director of Millspaugh, has been appointed deputy chairman.

Mr. WILLIAM TURNBULL has received a presentation on his retirement as general manager of Blyth Dry Docks & Shipbuilding Company, Limited. The presentation was made by his successor, Mr. H. MITCHESON. Mr. Turnbull's retirement brings to an end an association of nearly 50 years with the ship building and repairing industry. He had been general manager of the Blyth yard for 17 years.

Mr. J. STUART ANDERSON, who recently resigned from the position of Deputy Provincial Treasurer of the Province of Manitoba, has been elected assistant to the vice-president and also assistant treasurer of the International Nickel Company of Canada, Limited. Mr. Anderson has also been elected assistant vice-president and assistant treasurer of the International Nickel Company, Inc., the company's United States subsidiary.

New chairman of the governors of the Birmingham College of Advanced Technology is Mr. J. A. HUNT, general manager of the Hymatic Engineering Company, Limited, Redditch. A governor of the College for the past nine years, Mr. Hunt is also chairman of the governing body of Redditch College of Further Education and a member of the general and executive Council of the British Association for Commercial and Industrial Education.

Dr. L. L. ROSS has been appointed managing director of Elliott Brothers (London), Limited, a subsidiary of Elliott-Automation, Limited. Mr. L. BAGRIT will continue to be chairman and chief executive. Mr. E. O. HERZFELD, the controller, has, in addition, been appointed deputy managing director; and Mr. G. C. FAIRBANKS and Comdr. H. PASLEY-TYLER have been appointed assistant managing directors. Mr. L. S. UPSDELL, secretary of the company, has joined the board.

Mr. R. F. NEWMAN has been appointed managing director of Transport Equipment (Thornycroft), Limited, and a director of John I. Thornycroft & Company, Limited. Lieut.-Comdr. J. W. THORNYCROFT, who was elected deputy-chairman of the latter company in September of last year, has relinquished the post of managing director of Transport Equipment (Thornycroft), but will continue to be chairman of the board of that company. Captain G. VILLAR and Mr. L. L. HOLT have retired from their executive positions and from the board of John I. Thornycroft. Mr. IAN CAMERON has been appointed general manager and Mr. F. B. CRABTREE, commercial manager, of the company's Southampton works.

Mr. VERDON O. CUTTS, F.I.M., is resuming his consulting practice from his home address, 1, Ramsay Lodge, Hillside Road, St. Albans. There can but be few people who have had a wider experience of electrometallurgy than Mr. Cutts. In his early days he pioneered experiments on electric melting processes, but later turned his attention to the development of electric heat-treatment plant. In 1929, he joined the General Electric Company, Limited, when he organized the process heating department, covering electric furnaces, melting and heat-treating including eddy-current, di-electric and infra-red heating for a wide range of industries. He has travelled widely and spent quite a time in South Africa. In 1953, he was president of the electric furnace section of the Paris International Congress on Electro-heat.

Raw Material Markets

Iron and Steel

Foundries in many parts of the country have just resumed work following the annual holidays. During the break repairs to plant and cupolas were undertaken, while there was also a general suspension in the receipt of raw materials during the holiday period, stocks at most foundries being quite sufficient to cover requirements on the resumption of production.

Makers of all grades of foundry pig-iron and hematite have tonnages to spare from their current outputs and have also substantial stocks which they are anxious to reduce. Apart from the low-phosphorus irons, which continue in good demand, the call for all other irons is moderate and well below the capacity of the furnaces. In high-phosphorus irons and hematite many producers are working below capacity, but still are unable to dispose fully of the reduced tonnages, and the continued process of placing consignments into stocks to add, in many instances, to the appreciable quantities already held by the makers is uneconomic and costly.

The makers of castings for the motor vehicle trade have good order-books and the prospect of continued production at satisfactory levels for some time ahead. Some of the foundries supplying castings to the machine-tool trade report a slight improvement in business, but the foundries producing high-duty castings for other users could undertake more business than that at present being received. Most of the light foundries have room for a much larger volume of work than current orders provide, while the jobbing and textile foundries are also short of orders.

Adequate supplies of scrap continue to reach the foundries, although the better and heavier grades of cast-iron and machinery scrap are not so plentiful as other grades. Foundry coke deliveries are satisfactory and ganister, limestone, and firebricks remain in good supply.

The improved trade at the re-rollers is maintained, while the demand for small bars and light sections is now on a much-increased scale, and there is a heavy call for reinforcing rods. With the present requirements for steel semis many of the steelworks are committed for their outputs for the next few weeks.

Symposium on Electrometallurgy

In the spring of 1960, the Electrometallurgical Centre of the Italian Metallurgical Association (AIM) is organizing, in Milan, a symposium on the electrolysis of molten salts and the production of special non-ferrous metals by electrothermic methods. There are to be visits to research institutes and electrometallurgical works after the symposium. Registrations and papers should be sent to the secretary of AIM before December 31. Preprints will be available from the secretary of the *Associazione Italiana di Metallurgia*, via Moscova 16, Milan, Italy.

Import Duty on Ferro-cerium

The UK Treasury have made the Import Duties (General) (No. 8) Order, 1959, which increases from 10 per cent. to 20 per cent. *ad valorem*, the import duty chargeable under the Import Duties Act, 1958, on ferro-cerium and other pyrophoric alloys in pieces weighing not more than 4 oz. The Order came into operation on July 2 and was published as Statutory Instruments 1959, No. 1250.

POA "Minibition" and Courses

For the tenth year in succession, the Purchasing Officers' Association has organized a "Minibition," and this year it is to be held in Folkestone from September 24 to 26. One-hundred-and-four companies have taken up the 124 stands available, and a very wide range of industrial products will be covered by the displays. As in previous years, in the competition for the best stands, two awards will be made—one for the educational value of the display and the other for attractiveness of design. Amongst the stands with a foundry interest will be those of:—A.P.V.-Paramount, Limited (stainless- and special-alloy steel castings); Birfield Industries, Limited (filters, control valves, transmission units and drives, bearings, castings, etc.); British Investment Casters' Technical Association (precision investment castings); Crane, Limited (valves and pipe fittings); Firth-Vickers Stainless Steels, Limited (Staybrite and stainless steels); Hadfields, Limited (precision castings); R. J. Hunt & Son, Limited (quality grey-iron castings); Langley Alloys, Limited (alloy valves, castings and bar in bronzes); D. Napier & Son, Limited (high-precision investment castings); Samuel Osborn & Company, Limited (steel castings, etc.); P.I. Castings (Altrincham), Limited (investment castings); Sterling Industries, Limited (plain bearings, phosphor bronze, shell-mould castings); Henry Wallwork & Company, Limited (iron castings); West Yorkshire Foundries, Limited (iron and aluminium castings); and Wilmer Lea (Wheels and Castors), Limited (iron castings).

Courses

The following courses are also announced by the Purchasing Officers' Association:—

Scottish senior buyers' course and regional conference to be held at the Golden Lion Hotel, Stirling, from November 19 to 21. For this non-residential course the cost is £3 13s. 6d. per day. *Senior buyers' course*, at the College of Aeronautics, Cranfield, Beds. from January 5 to 9, 1960 (to be repeated in September, 1960, if demand warrants). This is a residential course, the fee for which is £15 15s. 0d. *Industrial Buyers' Rôle in Constructional and Engineering Contracts*—a course for those involved in letting contracts for buildings and plant, to be held at the Stationers' Hall, London, E.C.4, from February 16 to 18, 1960; non-residential, fee £11 0s. 6d. *The Third Oxford Course*, comprising material studies, case studies and lectures for top level buyers, at Christ Church and Pembroke College, Oxford, from March 21 to 26, 1960; residential, £20. *Computer Course* at the College of Aeronautics, from January 5 to 9, 1960; residential, £20, and the *Operations Research Study Group* which will be combined with the Third Oxford Course from March 21 to 26; residential, £25. Detailed programmes of these courses will be available two months beforehand from the Association at Wardrobe Court, 146A, Queen Victoria Street, London, E.C.4.

THERE HAS BEEN A CRISIS in the affairs of the High Authority of the European Coal and Steel Community, as at a recent meeting the Council of Ministers openly differed with the Community's five-point programme for dealing with excess coal production. The three Benelux countries voted in favour of the High Authority's programme, but France, Germany and Italy voted against it. Thus the situation is still chaotic and no permanent solution is in sight.

Current Prices of Iron, Steel, and Non-ferrous Metals

(Delivered unless otherwise stated)

August 12, 1959

PIG-IRON

Foundry Iron.—No. 3 IRON, CLASS 2, 10-ton lots or over: Middlesbrough, £21 6s. 0d.; Birmingham, £20 18s. 3d.

Low-phosphorus Iron.—Over 0.10 to 0.40 per cent. P, 6-ton lots or over, £23 5s. 0d., delivered Birmingham, £23 10s. 0d., delivered Grangemouth.

Cylinder and Refined Irons.—North Zone, £25 6s. 6d.; South Zone, £25 9s. 0d.

Refined Malleable.—P, 0.10 per cent. max.: North Zone, £26 6s. 6d.; South Zone, £26 9s. 0d.

Hematite.—Si up to 2 per cent., S. & P. over 0.03 to 0.05 per cent., 6-ton lots or over: N.-E. of England (local iron), £24 14s. 0d.; Scotland (Scotch iron), Zone S.1, £25 0s. 6d.; Sheffield, £26 2s. 6d.; Birmingham, £26 11s. 6d.; Wales (Welsh iron), £24 14s. 0d.

Basic Pig-iron.—£20 3s. 0d., delivered Staffs, Derbyshire, Notts, Lincs, Rutland, Northants, and Leicestershire, in 6-ton lots or over.

FERRO-ALLOYS

(Per ton unless otherwise stated, delivered)

Ferro-silicon (6-ton lots and over).—45 per cent. Si, £41 0s. 0d. to £43 10s. 0d., scale 15s. 0d. per unit; 75 per cent. Si, £56 10s. 0d. to £60 10s. 0d., scale 15s. 0d. to 16s. 0d. per unit.

Ferro-vanadium.—50/60 per cent., 22s. 6d. per lb. of V.

Ferro-molybdenum.—65/70 per cent., carbon-free, 12s. 10d. per lb. of Mo.

Ferro-titanium.—20/25 per cent., 2-3 per cent. Cu, £250 0s. 0d.; 38/40 per cent., commercially carbon-free, £287 0s. 0d.

Ferro-tungsten.—80/85 per cent., 8s. 7d. per lb. of W.

Tungsten Metal Powder.—98/99 per cent., 11s. 7d. per lb. of W.

Ferro-chrome (6-ton lots and over).—4/6 per cent. C, £77 0s. 0d. to £81 0s. 0d., basis 60 per cent., Cr, scale 26s. 0d. to 27s. 6d. per unit; over 6 per cent. C, £74 10s. 0d. to £77 10s. 0d., basis 60 per cent. Cr, scale 26s. 0d. to 27s. 6d. per unit; 2 per cent. C,* 1s. 7½d. to 1s. 10½d. per lb. Cr., 1 per cent. C,* 1s. 8d. to 1s. 11d. per lb. Cr; 0.15 per cent. C,* 1s. 9d. to 2s. 0d. per lb. Cr; 0.10 per cent. C,* 1s. 9½d. to 2s. 0½d. per lb. Cr; 0.06 per cent. C,* 1s. 9¾d. to 2s. 0¾d. per lb. Cr.

Metallic Chromium.—98/99 per cent., 6s. 10d. per lb.

Metallic Manganese.—94/96 per cent., carbon-free, £245 0s. 0d.; 96/98 per cent., £275 0s. 0d.

Ferro-columbium.—65/72 per cent., cb + Ta, 19s. 9d. per lb., cb + Ta.

Ferro-manganese (standard).—78 per cent., £66 0s. 0d.

SEMI-FINISHED STEEL

Re-rolling Billets, Blooms, and Slabs.—BASIC: Soft u.t., 100 tons & over, £31 15s. 6d.; tested, 0.08 to 0.33 per cent. C, 6 to 35 tons, £33 15s. 6d.; hard (0.41 to 0.60 per cent. C), under 10 tons, £34 17s. 0d.; silico-manganese, under 10 tons. £43 16s. 6d.; free-cutting, under 10 tons, £36 14s. 6d. SIEMENS MARTIN ACID (under 10 tons): Up to 0.25 per cent. C, £41 1s. 0d.; silico-manganese, £44 4s. 0d.

Billets, Blooms, and Slabs for Forging and for Stamping (under 10 tons).—Basic, soft, up to 0.33 per cent. C, £38 10s. 0d.; basic hard, over 0.41 up to 0.60 per cent. C £39 12s. 6d.; acid, up to 0.25 per cent. C, £43 4s. 0d.

* Average 68–70 per cent.

FINISHED STEEL

Heavy Plates and Sections (under 10 tons).—ship plates (N.-E. Coast), £42 2s. 0d.; boiler plates (N.-E Coast), £44 12s. 0d.; floor plates (N.-E. Coast), £43 11s. 0d.; angles (N.-E. Coast), £39 16s. 6d.; joists (N.-E. Coast), £39 12s. 6d.

Small Bars, Sheets, etc.—Rounds and squares, under 3 in., and flats 5 in. wide and under, untested soft basic, 50 tons and over, £39 1s. 0d.; under 10 tons to 4 tons, £40 18s. 0d.; under 4 tons to 2 tons, £41 3s. 0d.; hoop and strip, coils, 100 tons and over, £38 0s. 0d.; uncoated strip mill coils, hot rolled, under 3mm. to 12g., 25 tons to under 50 tons, £43 16s. 0d.; black sheets (hand mill), 24g., 10 tons and over, £57 14s. 6d.; galvanized corrugated sheets, 24g., 10 tons and over, £66 10s. 0d.

Alloy Steel Bars.—1 in. dia. and up: Nickel, £68 10s. 0d.; nickel-chrome, £99 4s. 0d.; nickel-chrome-molybdenum, £111 17s. 0d., in lots of 5 tons to under 10 tons.

NON-FERROUS METALS

Copper.—Cash, £234 10s. 0d. to £234 15s. 0d.; three months, £234 0s. 0d. to £234 5s. 0d.; settlement, £234 15s. 0d.

Copper Tubes, etc.—Solid-drawn tubes, 2s. 2½d. per lb.; rods, 243s. 0d. per cwt. basis; 20 s.w.g., 273s. 0d. per cwt.

Tin.—Cash, £792 10s. 0d. to £793 0s. 0d.; three months, £790 10s. 0d. to £791 0s. 0d.; settlement, £793 0s. 0d.

Lead (Refined Pig).—First half August, £71 5s. 0d. to £71 10s. 0d., first half November, £72 5s. 0d. to £72 10s. 0d.

Zinc.—First half August, £85 5s. 0d. to £85 10s. 0d.; first half November £83 2s. 6d. to £83 17s. 6d.

Zinc Sheets, etc.—Sheets, 15g. and thicker, all English destinations, £119 7s. 6d.; rolled zinc (boiler plates), all English destinations, £117 12s. 6d.; zinc oxide (Red Seal), d/d buyers' premises, £97 10s. 0d.

Brass Tubes, etc.—Solid-drawn tubes, 1s. 9⅞d. per lb.; sheets to 10 w.g., 195s. 0d. per cwt.; wire, 2s. 7½d.; rolled metal 195s. 0d. per cwt.

Brass (Brazing).—BS1400, B3, £155; B6, £200.

Brass (High Tensile).—BS1400, HTB1, £187; HTB2, £203; HTB3, £213.

Gunmetal.—BS1400, LG2, £191; LG3, £201; G1, 1%, £254; G1, 1%, £240.

Phosphor Bronze.—BS1400, PB1 (AID released), £287; BS1400: 90/10/1, £272.

Leaded Phosphor Bronze.—BS1400, LPB1, £211.

Phosphor Bronze Strip, etc.—Strip, 282s. 0d. per cwt.; wire, 4s. 0½d. per lb.; rods, 3s. 3½d.; tubes, 3s. 3½d.; chill cast bars: solids 3s. 3d.; cored 3s. 4d. (CHARLES CLIFFORD, LIMITED.)

Nickel Silver, etc.—Rolled metal, 3 in. to 9 in. wide × 0.056, 3s. 9½d. per lb.; round wire, 10g. in coils (10 per cent.), 4s. 2½d.; special quality turning rod, 10 per cent., ½ in. dia., in straight lengths, 4s. 1½d. All prices are net.

Other Metals.—Magnesium, ingots, 2s. 3d. per lb. Antimony, English, 99 per cent., £190 0s. 0d. Quicksilver, ex-warehouse, £74 0s. 0d. Nickel, £600 0s. 0d. Aluminium, ingots, £180 0s. 0d.; aluminium bronze (BS1400), AB1, £229; AB2, £243.

Obituary

Mr. JAMES MITCHELL, former chairman and managing director of Mitchell, Russell & Company, Limited, Bonnybridge ironfounders, has died.

The death is reported of Mr. MATHEW HAY (53), manager of the Glasgow branch of A. Cohen & Company, Limited, ingot and metal manufacturers.

Thomas Carling & Company, Limited, of Shakespeare Brass Works, Salop Street, Bolton, report the death of their representative, Mr. W. E. SEDDON, on July 31.

Mr. JAMES S. WEBSTER, manager of Enamelled Metal Products Corporation (1933), Limited, Durie Foundry, Leven, Fifeshire, Scotland, died suddenly last month.

The death has occurred of Mr. JOHN GOODRICH KAY, a director since its inception in 1923 and chairman since 1948, of the Lafarge Aluminous Cement Company, Limited, London, W.1.

The death has occurred, at the age of 68, of Councillor CHARLES COOPER, a former joint managing director and head of the gas and chemical engineering division of W. C. Holmes & Company, Limited, Turnbridge, Huddersfield.

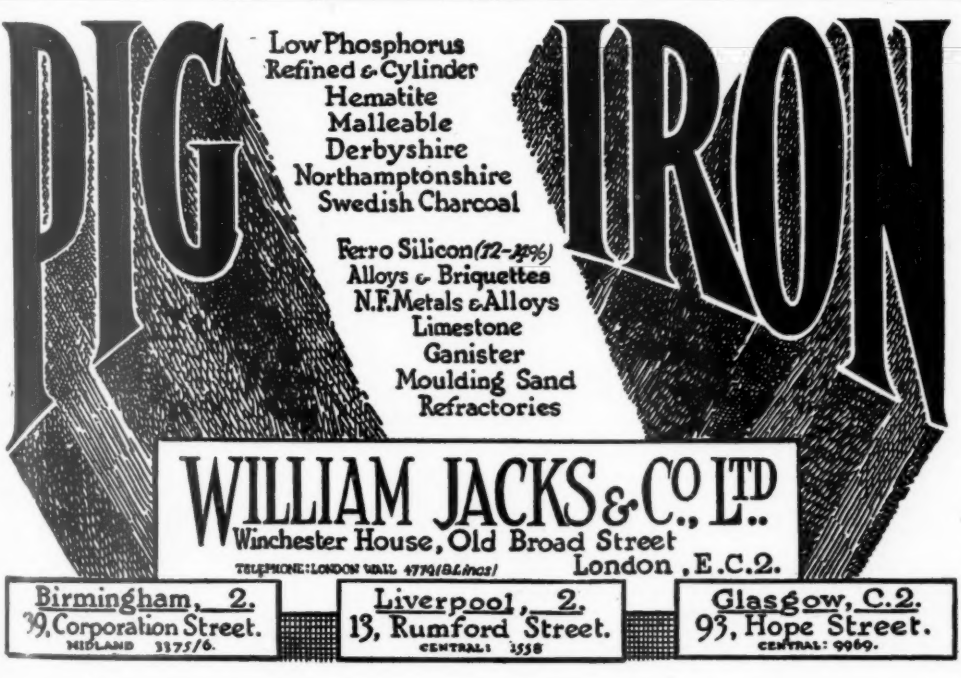
The death has occurred of Mr. JOSEPH DOUGHTY, a director of the Moston Malleable Castings Company, Limited, Manchester. Mr. Doughty who was 75 had been with the firm for 45 years, and was made a director in 1945.

VISCOUNT WEIR OF EASTWOOD, chairman and director (for 43 years and 57 years respectively) of G. & J. Weir, Limited, Glasgow, died on July 2, at the age of 82. On his retirement as chairman and director in 1955 he was appointed the first hon. president of the Weir group of companies.

Mr. JOSEPH BOLTON, former manager of Andrew Weir & Company, Limited, shipbrokers, Middlesbrough, for over 30 years and honorary secretary of the Middlesbrough and District Shipbrokers' Association for 25 years, has died at the age of 72. He joined the concern of Andrew Weir in 1907, and was manager from 1919 until retirement in 1952.

Sir RONALD MATTHEWS, who died on July 1 at the age of 74, began his business career in the family steel business of Turton Brothers and Matthews, Limited, Sheffield, subsequently becoming chairman and managing director. He was Master Cutler in 1922 when he was only 37; president of Sheffield Chamber of Commerce in 1929, and president of the Association of British Chambers of Commerce in 1940-42. He was knighted in 1934. Sir Ronald had also served on the boards of a number of other concerns including the Legal and General Assurance Society, the Brush Group, and General Refractories, Limited.

Sir FREDERICK PICKWORTH, chairman of the English Steel Corporation, Limited, Sheffield, died on July 14 at the age of 69. He collapsed after speaking at a dinner which was given in recognition of his chairmanship of the Darlington Forge, Limited, a post he gave up in 1957 when he became Master Cutler. He was secretary of the English Steel Corporation from 1930 before becoming managing director in 1944. He was also chairman of Taylor Brothers & Company, Limited, Manchester, and of Firth-Vickers Stainless Steels, Limited, Sheffield and a Council member of the Federation of British Industries. Sir Frederick was knighted in 1957.



Factories Act, 1959

The Factories Bill, which was introduced into the House of Commons in November, 1958, and completed its passage through Parliament early in July, received the Royal Assent on July 29. The new Act amends the Factories Acts, 1937 and 1948, and makes further provisions as to the health, safety and welfare of workers in factories, and other places subject to the Factories Acts. The Act does not come into operation at once. The Minister of Labour is given power to bring the provisions into effect by Order, and to appoint different days for different purposes.

In a Parliamentary written answer, the Minister, Mr. Iain Macleod, indicated that it was his intention to bring all the provisions into operation at the earliest practicable date. He intended, subject to consultations with interested organizations, to make an Order bringing about half of the provisions into operation on December 1. Certain of the other provisions—for instance the sections on cleanliness, dangerous substances, safe means of access and place of work, dangerous fumes, washing facilities, first aid—will involve preparatory work being done by the employers—for example, the construction of fencing, the provision of new equipment or the necessary training of workers—and some extra time must be allowed for these purposes.

Fire Provisions

The important fire provisions of the Act (sections 9 to 17 and 24) involve administrative changes affecting local authorities and the Factory Inspectorate, and these will have to be discussed with the local authorities concerned before the date of operation can be decided. Consultations are being started in the immediate future. Discussions with the British Transport Commission about the section extending the scope of factory legislation to railway running sheds have begun. The new provisions in section 8 (i) of the Act about examination of steam boilers will not be brought into operation until the Minister has received and considered the report of an Advisory Committee, under the chairmanship of Mr. G. C. Honeyman, Q.C., which he appointed last year to look into this question.

The new Act has three main objects; to improve the existing provisions with regard to fire precautions in factories: to place on the Minister of Labour and National Service the duty of promoting health, safety and welfare in places under the Factories Acts by collecting and disseminating information, and by carrying out, and assisting to carry out, investigations: and to revoke Defence Regulation 59, and replace it with a permanent, but more limited power to grant exemptions from the law regulating the hours of employment of women and young persons.

In addition, the Act increases the maximum fines which can be imposed for contraventions of factory law, and strengthens certain existing safety provisions of the Factories Act, 1937, including those relating to dangerous substances and fumes, lifts and cranes, and the maintenance of floors, passages and stairs. The Act also extends the scope of factory legislation to cover railway running sheds, where running repairs are carried out to locomotives.

After 61 years' continuous service at the Vulcan Ironworks of Green & Carter, Limited, Winchester, Hants, 74-year-old Mr. A. COOMBES recently retired. In recognition of his long service he was presented with a cheque by the directors of the company.

Clean Air Act Order

Section 11 (4) of the Clean Air Act, 1956, which relates to smoke control areas, empowers the Minister of Housing and Local Government, by order, to exempt any class of fireplace (meaning furnace, grate or stove), upon such conditions as he may specify, from the provisions of the section—if he is satisfied that such fireplaces can be used for burning fuel other than authorized fuels without producing smoke or a substantial quantity of smoke. An earlier order exempted oil-burning furnaces, and there has now been one issued (No. 1207, 1959, in operation from July 17) which exempts fireplaces equipped with mechanical stokers, and two specified stoves. Details and conditions are as follow:—

Class of fireplace	Conditions
Fireplaces, other than fireplaces fired by pulverized fuel, constructed on or after December 31, 1956, and equipped with mechanical stokers, or adapted on or after that date for use with such stokers.	The fireplace shall be so installed, maintained and operated as to minimize the emission of smoke. No fuel shall be used other than that for which the mechanical stoker was designed.
The fireplace known as the solid fuel Ductair unit, manufactured by Radiation, Limited.	The fireplace shall be so installed, maintained and operated as to minimize the emission of smoke, and in any case in accordance with the manufacturers' instructions.
The fireplace known as the Fulgora slow-combustion stove, manufactured by Fulgora Stoves, Limited.	The fireplace shall be so installed, maintained and operated as to minimize the emission of smoke, and in any case in accordance with the manufacturers' instructions. No fuel shall be used other than wood waste in clean condition.

DSIR Technical Digests

As was recently announced in the JOURNAL, the *Technical Digests* of the Department of Scientific and Industrial Research are again being published monthly. Several items of interest to foundrymen are detailed in the June issue, amongst them being a smoke-density indicator, which has been produced to indicate when dark smoke is being produced in a furnace. Although mainly intended for Lancashire and Cornish type boilers, it is possible to adapt the indicator for some other types. News is also given of a dust barrier screen consisting of an open-weave material impregnated with a non-drying adhesive; a portable power point; an approach warning system which has been developed primarily to give warning of approach when two cranes are operating on the same overhead track; a midget hoist, made of N.S.4 aluminium, which, whilst small enough to fit into a coat pocket, is said to be capable of lifting or pulling weights of up to 1,000 lb. Yet another atmospheric dust instrument is dealt with, this time for ascertaining the degree of contamination of the air; details are also given of fabric tanks for transporting liquids, and of a simple inspection aid which replaces the watchmakers' eye-glass for the examination of small parts. Copies of these *Technical Digests* are obtainable from the DSIR at Charles House, 5-11, Regent Street, London, S.W.1.

Mr. R. JAMES, Mr. J. F. ORMISTON and Mr. H. WHEELER have resigned from the board of the Barrow Hematite Steel Company, Limited.

Foundry in a Church Tower

It is unlikely that the Charlemont Barracks cast-iron altar in its Catholic Church can be rivalled elsewhere in Britain as an example of ecclesiastical casting. (This Irish altar, cast at the Armagh Foundry in 1848, was described in the JOURNAL during January, 1959.)

However, South Wales and Monmouthshire—as might be expected from its industrial history—can show a few unusual examples of the use of iron in church architecture and decoration—albeit not on a par with the craftsmanship of the Armagh altar. The threshold of the porch at St. Peter's Church in Blaenavon, for instance, is iron cast from the local works. The church itself was built in 1804 by Hopkins and Hill, who at that time owned the extensive coal, iron and steel works which comprised nine blast furnaces, three rolling mills and one tyre mill.

The only producing iron-ore mine left in Wales is that at Llanharry on the verge of the Vale of Glamorgan, worked for many years by the Glamorgan Hematite Iron Ore Company. In its church is an iron coat-of-arms of the Gibbons family of Trecastle. This unusual medium for a coat-of-arms commemorates not only the family but also the ancient industry of the neighbourhood, for iron has been mined here for at least 700 years of recorded history—and prior to that by the Romans.

Within sight of the Llanharry iron-ore mine is the hill-top town of Llantrisant, where the parish church yielded the unique discovery of a foundry actually within the church precincts. When the last restoration of the parish church took place in 1893, the furnace and moulds for casting the bells were located beneath.

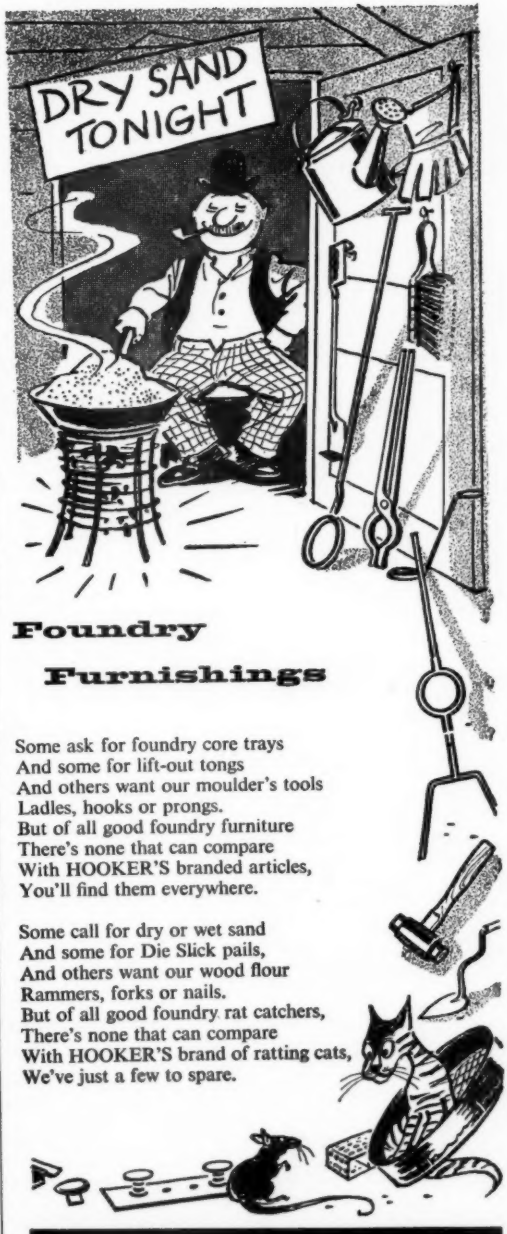
Another Cast-iron Clock*

Back in the Middle Ages (and of course much later) blacksmiths were clockmakers, and those whose skill was perfect in the craft were called "clocksmiths." These old-time craftsmen worked, however, in wrought iron, but there is a record of one man who made a clock from cast parts. He was James Scott of Ballynahinch, Co. Down, Ireland, and he was, in fact, a conventional clockmaker. In 1832 he was commissioned to make a large clock to strike the hours for Lord Roden's mansion house. Scott decided to make the clock parts as castings, the parts including the frame plates, wheels, shrouds of the lantern pinions, dial, hands, and weights, etc. Only the pinions were to be made of steel and the striking levers.

All the castings were produced in Boyd's Foundry, Belfast, under Scott's supervision, and were finished by him in his own workshop. It was said of the wheels that they were of great dimensional accuracy, and finely geared, in order to reduce friction *a desideratum* in mechanics. The frame of cast iron was well cast and the pivots of the pinions were bushed with brass, slot-keyed in the castings. The dial was convex, like a dish, with bars for the numerals raised from the plane of the casting. The curvature of the dial was convex to reduce wind pressure on the hands for, when in position, the clock was exposed to mountain and marine gales. The clock hands were cast to the sweep required.

This was perhaps the only instance of cast iron being used as the major material for clockmaking, although frames for tower- and turret-clocks were of course made of cast iron by many clockmakers.

* An account of a cast-iron clock at Tredegar appeared in the JOURNAL, August 7 1958.



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Book Reviews

Applied Mechanics—Proceedings of the Third US National Congress, 1958. Published by Pergamon Press, Limited, 4 & 5 Fitzroy Square, London, W.1; price £7.

This book is an authoritative work of 864 pages giving information on over 100 subjects; it contains the complete texts of four invited general lectures and 97 technical papers. The general lectures deal respectively with "Linear Thermodynamics and the Mechanics of Solids," "Some Aspects of Boundary-layer Flow in Subsonic and Supersonic Air Streams"; "A Survey of the Theories of Creep Buckling," and "Rotational Symmetric Problems in the Theory of Thin Elastic Shells."

The technical papers are arranged in four groups under the following headings: (1) Dynamics, Vibrations, Elastic Waves. (2) Elasticity, Elastic Structures. (3) Plasticity, Viscoelastic Flow, Fracture, and (4) Fluid Flow, Serodynamics, Heat Transfer.

On occasion, a study of advanced theoretical investigations has been decried as unnecessary for the "man in the shop," but it must be remembered that in all branches of applied science what is regarded as the borderland of knowledge to-day becomes the everyday experience to-morrow, and in the volume under review, are to be seen some of the points of growth from which to-morrow's practical developments will come. It is, therefore, incumbent upon all who are producers and users of materials to make themselves familiar with the possibilities for their more economic utilization.

The papers in this volume cover an extremely wide range of interests, and present a broad picture—within the field of applied mechanics—of the research activities in which American universities, industrial and Government research organizations are engaged. This work constitutes a most valuable record, and can be recommended for careful study by engineers, designers, and all those responsible for the economic utilization of engineering materials. J. E. GARSIDE.

Filler Metals for Joining by Orville and Barnett. Published by Chapman & Hall, Limited, 37 Essex Street, London, W.C.2; price 57s. 3d. post free.

This book contains detailed information on the use and applications of the majority of coated electrodes, bare wires for gas-shielded welding, automatic welding, brazing and soldering that are manufactured in the United States. Eight chapters are devoted to coated electrodes for welding mild and low-alloy steels, and the reasons for the necessity for so many different types are admirably set down.

Whilst there is no doubt that this book will find a place at the elbow of every American welding engineer, its usefulness in Great Britain will be more restricted since it deals exclusively with American-designated filler wires. For those who read American welding literature or work to American specifications, the book will be an invaluable ready reference, since it gathers together all the relevant information about filler wires and will save endless searching through specifications.

It is rather novel to have a book which includes a great deal about weldability written from the standpoint of the filler metal rather than the parent metal, and much of the information given concerns the British welding equivalent.

It is to be hoped that future editions will contain an appendix listing the main British equivalents which would make the book more readily accepted over here. There is little in this book for the foundryman who wishes to repair castings by welding.

E. N. GREGORY, A.I.M., A.M.INST.W.

Publications Received

Use of Fulbond in Foundries. Issued by the Fullers' Earth Union, Limited, Patteson Court, Nutfield Road, Redhill, Surrey.

This 40-page brochure is extremely informative and covers a wide range of applications. Montmorillonite, which is the basis of Fulbond, is both well and interestingly covered in a special introductory paragraph. The two main grades of Fulbond, 4A and 2, have their origins in two separate locations, the former coming from Surrey and the latter from Somerset. Their uses, which are somewhat different, are set out on page 5. Some three pages are used to detail the fundamental properties, and thereafter, specific applications to naturally-bonded, semi-synthetic and other types of moulding sands are dealt with. Another application is in the case of the CO_2 Process. Finally, there is a series of graphs covering the results obtained when using Fulbond with 21 well-known sands. This is an extremely useful publication to have in a foundry manager's office.

Report of the Research Council for 1958. Published for the Department of Scientific and Industrial Research by Her Majesty's Stationery Office, York House, Kingsway, London, W.C.2; price 3s. 6d. net.

In this Report the Council envisages that the expenditure on revenue and capital grants to research associations will rise by about a third, because their scope and activities are steadily growing, but a large percentage contribution is expected from industry. The programme outlined entails an expenditure of £61,000,000 in 1959 to 1964, compared with £36,000,000 for the 1954-59 period.

The Report suggests that research associations could undertake sponsored researches, provided the work entailed does not clash with the general research programme scheduled to be carried out. More money is to be spent on research work carried out in the universities.

S.G. Iron in Steelworks Plant by A. B. Everest, Ph.D. Issued by the Mond Nickel Company, Limited, Thames House, Millbank, London, S.W.1.

The publicity for castings, belatedly, is aligning itself with the high standard set by other industries, and this brochure is in every way equal of material issued anywhere. The contents take each of the major departments of a steelworks and show just where s.-g. iron can be used to advantage. Whilst the brochure is written for steelworks, quite a few of the applications shown are equally applicable to foundries, and foundrymen could very usefully "take their own medicine." Yet, many of the potential users manufacture steel castings themselves and home productions initially carry an economic advantage. The booklet is backed in an attractive slate-blue cover; the letterpress is easy to read, and the illustrations—drawn from three continents—are excellent.

British Engineers' Association Handbook, 1959. Published by the British Engineers' Association, 32, Victoria Street, London, S.W.1; price 21s.

This is a very complete directory of the members of the British Engineers' Association, as it lists in Section 1, the member-firms' names and addresses, agents and type of production. Section II expands this information by full-page advertisements. The third section is a classified directory carried out in four languages, and the fourth covers trade marks and the like. It is a very useful directory to have at hand.